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THE PROCESS OF DECISION - MAKING AND ITS
APPLICATION TO INDUSTRIAL LOCATION PROBLEMS

by

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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF BUSINESS ADMINISTRATION

FACULTY OF BUSINESS ADMINISTRATION AND COMMERCE

EDMONTON, ALBERTA

May, 1968

UNIVERSITY OF ALBERTA
FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and
recommend to the Faculty of Graduate Studies for acceptance, a
thesis entitled THE PROCESS OF DECISION-MAKING AND ITS APPLICATION
TO INDUSTRIAL LOCATION PROBLEMS submitted by HERMAN PETER KROEKER
in partial fulfilment of the requirements for the degree of
Master of Business Administration.

ABSTRACT

The purpose of this study was to examine the process by which Edmonton and Calgary manufacturers chose their plant locations (hereafter referred to as location-decisions). Both a theoretical and an empirical approach to location-decisions were examined. The theoretical approach consisted of a review of Location Theory and the Process of Decision-Making. The study then examined the applicability of this normative approach to choosing a plant location. The empirical approach involved surveys of Edmonton and Calgary manufacturers. The object of these surveys was to examine the method these manufacturers employed in determining their location-decisions. The extent to which a normative approach to location-decisions was or could have been used was then discussed.

The library research involved a review of the literature on the normative approach to plant location-decisions and its application in practice. Data for the empirical research was obtained by two detailed questionnaires. One questionnaire was sent to a sample of 319 Edmonton manufacturers, the other to a sample of 228 Calgary manufacturers. The sample, in both cities, consisted of all manufacturers who submitted a Manufacturers' Report to the Alberta Bureau of Statistics between the years 1959 and 1966. The names and addresses of these manufacturers were provided by the Alberta Bureau of Statistics. The basic findings of this study follow.

A normative, general procedure for decision-making was found to be applicable to location-decisions. This study demonstrated, however, that the procedure required minor adaptation to the special circumstances of each firm every time a location-decision was made. The reason for this adaptation was that each industrial firm had particular objectives, problems, opportunities, and a constantly changing environment.

Such a normative approach had been employed to a decidedly limited extent by the industrial firms surveyed. The majority of the location-decisions in Edmonton and Calgary had been made without a theoretically suitable evaluation of alternative locations. A substantial number of firms considered only one plant site. However, most firms were satisfied with their choice of location. The author suggested that a reason for their satisfaction may be their lack of knowledge of alternative possibilities.

In the aggregate, Edmonton and Calgary firms stressed the same location factors. The three main factors in both surveys were: (1) the fact that the decision-maker was already living in the city; (2) nearness to major markets; and (3) lack of competition in the area.

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CHAPTER I

INTRODUCTION

Purpose of the Study

The primary objective of this thesis is to examine the process by which Edmonton and Calgary manufacturers chose their plant location (hereafter referred to as location-decisions). This study consists of both library research and field work. The library research involves a review of the theoretical approach to decision-making and its applicability to location-decisions. The field work consists of a survey of a sample of Edmonton and Calgary manufacturers.¹ Based on the questionnaire method,² this survey attempts to examine: (1) the extent to which alternative plant locations are considered; (2) the relative importance of location factors;³ and (3) the extent to which firms are satisfied with their choice of location.

Organization of the Study

This study examines both a theoretical and an empirical approach to plant location-decisions. Chapter II constitutes the theoretical approach. This section reviews the literature on the process of decision-making, business objectives, management theory, and location theory. Chapter III outlines the technique employed in the empirical approach. Data is obtained by two detailed questionnaires.⁴ One questionnaire was mailed to a sample

¹For a detailed description of the compilation of the sample, see pages 30 and 31 of Chapter III.

²Specimens of the questionnaires are included in the appendix to Chapter III.

³Location factors as used throughout this thesis refer to forces or elements that attract manufacturers to choose a particular location for their plant site.

⁴See footnote 2.

of 319 Edmonton manufacturers and the other was mailed to a sample of 228 Calgary manufacturers.⁵ Chapter IV tabulates and analyzes the data obtained from the survey. The final Chapter summarizes the findings of the study and suggests possible avenues for further research.

Significance of this Study

Although a well established body of literature on the normative approach to plant location is available, empirical studies are lacking. This study attempts to add to the limited empirical data available. A sample of Edmonton and Calgary manufacturers are surveyed to examine their reasons for establishing their plant in its present location. These firms are asked to indicate the following:

1. The extent to which they searched for alternative plant locations.
2. The factors that influenced them to locate their plant in Edmonton (or Calgary).
3. The relative importance of location factors to their particular location-decision.
4. The degree to which they are satisfied with their location choice.

Knowledge of conditions sought by industry is of prime importance to both the individual firm and to industrial developmental agencies. The firm must decide which factors are necessary for its

⁵See footnote 1.

success. On the other hand, developmental agencies must determine which industries will be attracted by certain location factors. An understanding of location factors is helpful in both cases. By combining this understanding with knowledge of conditions which are attractive to industry, a community can plan more effectively for economic betterment.

Scope and Limitation of this Study

Surveys based on the questionnaire method are subject to generally recognized weaknesses. The most frequently cited criticism of such studies is that they are subjective. Moreover, such studies are based on ordinal rankings of loosely defined location factors that are believed to be important to businessmen in making their location-decisions.⁶ Another criticism often cited is that questionnaire-based surveys fail to make a distinction between the location problems of selecting a region and selecting a plant site. It is likely that certain location factors determine the selection of the general region while other factors determine the choice of the specific site within the region. Furthermore, businessmen completing the questionnaire may give the highest ranking to factors that they believe should be important rather than factors that motivated the location-decision. Finally, it should be noted that in all studies of this type, the samples include only those firms that located in the area under consideration. Therefore, the studies arbitrarily exclude firms that have considered locating in the area but failed to do so.

The questionnaire used in this study was pretested in a pilot survey in an attempt to minimize some of these recognized weaknesses.⁷ In order

⁶Questionnaires used in these surveys generally contain a list of location factors which are subject to the interpretation of the respondent.

⁷See page 29 of chapter III for details concerning the pilot survey.

to obtain additional information from the respondents, space was provided for qualitative answers. Few firms, however, took the trouble to elaborate. Due to reliance on secondary phenomena in this type of study, it is difficult to determine the correlation between what actually occurs in a location-decision and what executives report as occurring. A sound basis for further research will probably be forthcoming from investigation of first-order observation of actual location-decisions.

CHAPTER II

MANAGEMENT AND THE LOCATION-DECISION

Introduction

This chapter reviews the process of decision-making, business objectives, management theory, and location theory. The significance of this review is to show the relationship between location-decisions, management objectives, and the factors influencing decisions and objectives. Furthermore, the possibility of applying the theoretical process of decision-making to location-decisions is investigated.

Business Objectives and Management

A business firm is established to achieve certain objectives. The function of management is to administer the firm in order that these objectives may be effectively realized. Basically, the objectives of a business firm are related to the economic values provided by the impersonal organization. These objectives include (among others) profits, sales, physical expansion, or even prestige. In order to effectively achieve its economic objectives a firm must often consider, to varying degrees, the goals of individuals directly involved with the organization and the goals and expectations of society.¹ It should be noted that objectives provide more than a purpose or goal. In a sense, objectives give direction. Objectives properly expressed and utilized are guides to meaningful decisions, and in turn, action.²

¹Ralph C. Davis, The Fundamentals of Top Management (New York: Harper & Brothers, Publishers, 1951), p. 10.

²Professor Davis states in Fundamentals of Top Management, p.90: "It is evident that the business objective is of primary importance. It must be the starting point of thought and action in the conduct of business operations."

In order to have such utility for a particular business firm, objectives should be structured.

Some sort of conceptual framework embracing the whole range of objectives seems necessary if we are...going to use objectives...effectively. In some orderly way we must relate the 'grand design' type of objective with the much more limited objectives lower down in the organization.³

It is necessary to organize and compartmentalize objectives into classes that are useful for each decision-maker in the organization.⁴

Objectives are not provided to an individual business firm. The particular objectives of an individual business are developed by the managers of that organization. "Most enterprises operate within a framework of external and internal constraints."⁵ Therefore, each business firm has somewhat different objectives than those of any other firm. Each enterprise, accordingly, has similar general goals but different specific ones. Consequently, each firm has different guides to decisions and actions. This is true not only for the firm but for the various managers of the firm inasmuch as objectives are structured internally.

A business manager is "someone who attempts to achieve a goal through the direct efforts of others".⁶ His task is accomplished by means of the practice of management.⁷ Management includes (among other things) planning, organizing and controlling the activities of others in order to accomplish the objectives of the organization.

³Charles H. Granger, "The Hierarchy of Objectives," Harvard Business Review. May-June, 1964, p. 64.

⁴Ibid., p. 65.

⁵Ibid.

⁶William M. Fox, The Management Process (Homewood, Illinois: Richard D. Irwin, Inc., 1963), p. 5.

⁷As defined by Professor Davis, "business management is the function of executive leadership in business institutions." R.C. Davis, op. cit., p.6.

The function of management may be described in the following manner: (1) management is concerned with the establishment of objectives; (2) management decides in advance of action how these objectives are to be accomplished; (3) management provides the conditions that enable plans to be executed economically and efficiently; and (4) management initiates action and assures that the objectives are realized.

Decision-Making Process

Decision-making is necessary in order to plan. Webster's New Collegiate Dictionary defines a decision "as the result arrived at after consideration has been given." "Basic to the preparation of any plan is the recognition that a need exists."⁸ In other words, each plan may be formulated as a defined problem or an objective for the future.

Decision-making is required not only as a part of the process of problem solving but also as a part of the whole, and larger, process of management. Problem solving consists of: (1) defining the problem; (2) planning for its solution; and (3) implementing the plan. The process of management includes not only problem solving but, in addition, planning for future opportunity. This requires organization and control. Therefore, management involves decision-making: (1) to solve existing problems in order to meet current objectives; and (2) to progress as opportunities are recognized and objectives for future attainment are established.

⁸Preston P. LeBreton and Dale A. Henning, Planning Theory, (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1961), p. 61.

Decisions made within a firm can be classified along a continuum. At one end are the routine decisions and at the other end are the non-routine or "one-shot" decisions. Not only is there a difference in the number of times similar decisions are made in a year, but there is also a difference in the importance of the decision to the firm. In general, the importance of a decision is related to the frequency with which it is made. The important or irreversible decisions, such as those really involving the life or death of the firm, are made very rarely. Due to the excessive costs of wrong decisions, great emphasis is placed on making these decisions.

The decision-making process can be broken down into three steps.⁹ These are:

- (i) the intelligence step - searching the environment for conditions calling for decisions, putting questions on an agenda.
- (ii) design - inventing, listing, developing and analyzing the various alternative courses of action.
- (iii) choice or selection - among the alternatives so as to meet or approach some stated objective.

The decision-maker must seek the best possible method of obtaining the firm's objectives. "Effective planning involves a search

⁹Herbert A. Simon, The New Science of Management Decision (New York: Harper & Brothers, Publishers, 1960), pp. 1 - 8.

for the alternative representing the best path to a desired goal."¹¹

The best path is usually one which takes limiting factors into account.

It is possible to make an error in a decision by concentrating on limiting factors, but the complexity of many managerial decisions makes it impracticable to consider every aspect of every problem, and the risk involved in overlooking the less important aspects is usually less than the risk of inattention to the strategic factor.¹²

A decision can only be as good as the best of the alternatives taken into consideration. Therefore, managers must be creative in the search for promising alternatives. Managers cannot merely consider obvious, routine possibilities.

Newman and Summer point out that:

In order to appraise an alternative wisely, we must try to foresee the outcome if we select it as a course of action. The consequences are likely to be both desirable and undesirable, both immediate and long range, both tangible and intangible, both certain and only possible, and we should take all possibilities into account.¹³

These authors also offer various means of comparing alternatives. They suggest, first of all, the possibility of disregarding the common aspects of all proposed plans and focusing on differences in results. "Sunk costs" are used as an example for this suggestion:

One of the things we cannot change by any alternative is money already spent, that is, sunk costs. More precisely, sunk costs are past expenses and investments, or parts thereof, that cannot be retrieved by resale. Since sunk costs will remain the same regardless of which alternative is selected, we should...disregard them in thinking about which course of action to follow.¹⁴

¹¹Koontz and O'Donnel, op. cit., p. 136.

¹²Ibid.

¹³William H. Newman and Charles E. Summer Jr., The Process of Management (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1961), p. 302.

¹⁴Ibid., pp. 306 - 307.

Second, the authors reduce the complexity of the task of comparing alternatives. This is done by translating some of the factors into dollars of income, expense, or investment. A choice among alternatives depends on differences in their consequences. Insofar as we can compute net income or net expenses from each alternative, it is simple to subtract one from another to determine the difference in income or expense. Similarly, if any alternatives involve a change in investment, we can readily compute the difference in investment.¹⁵

In a third suggestion, Newman and Summer proposed concentration on decisive factors.¹⁶ Alternatives should be related to limits within which they must function, such as, financial limitations and/or capabilities of existing equipment. Further, when we choose among alternatives, "one, two, or perhaps three factors almost always are most important in making the decision. If we can single out and study these factors first, we may be able to eliminate the least attractive alternatives promptly."¹⁷

Currently it is possible for a manager to make use of certain "management science" techniques to assist in evaluating alternatives. Often difficulty is experienced in forming decisions that warrant this sort of assistance. This suggests that operations research techniques can aid in comparing alternatives, though, "actually, operations research techniques are too elaborate to most managerial problems."¹⁸

¹⁵Ibid., p. 308.

¹⁶Ibid., p. 313.

¹⁷Ibid., p. 314.

¹⁸Ibid., p. 315.

A comparison is not a decision. "Someone has to decide which set of projected results is best."¹⁹ To do this, Newman and Summer suggest: (1) placing values on principle results where possible; (2) adjusting for uncertainty by thinking in terms of probabilities, being sensitive to and adjusting for the bias in the opinion of others, and balancing the cost of more data against likely improvement in judgement; and (3) testing a choice by projecting detailed plans for implementation, reconsidering assumptions, securing consensus from other competent people, and then, where suitable, making test runs.²⁰

Location-Decision

For the location-decision, it is important to distinguish among the three steps in the decision-making process. Location-decisions are clearly non-routine or "one-shot" decisions. Once a plant has been constructed, it is usually relatively immobile. Its locations from the point of view of the firm can be changed either by selling it and building a new plant or by dismantling and rebuilding on a new site. Both methods are costly. Once a firm has built a plant, it is likely to remain at this site. Immobility forces the firm to remain at its present location even though, in retrospect, it may not appear to be the most profitable location. The three decision-making steps for the location-decision are now considered.

¹⁹Ibid., p. 322.

²⁰Ibid., pp. 322-340.

First, the firm must recognize that a new location for present facilities or for expanded facilities is a relevant question. Several conditions might bring about such recognition. For a firm in an expanding industry, the pressure of sales on inventory might lead to such recognition. In the case of firms in industries that are expanding very slowly or declining, recognition of the location question may come about in a different way. The firm might consider the question of location (probably relocation) when profit margins at the existing location are lowered. This suggests the impossibility of continuing the status quo. Also, firms may consider the location, at least indirectly, whenever major parts of plant or equipment must be replaced. The firm decides whether to replace at the present site or move to a new location.

Having recognized that the location question is relevant, it must be incorporated into the structure of objectives. In order to establish objectives for future attainment, many possible ideas and ways to fulfill them should be considered. Managers must, therefore, weigh the various solutions. Consequently, decisions are made as the manager selects courses of action designed to: (1) realize future opportunities; and (2) solve problems.

Evaluation of various possible locations requires some factual information concerning each of these locations. Some of the necessary information concerns input costs, some concerns factors for which cost cannot be specified, and some concerns factors for which there is no apparent effect on costs. The information that is collected for each of the potential locations must relate to the firm's set of standards used in choosing among the various alternatives.

A general procedure describing the main steps to follow in planning plant location may be devised in accordance with concepts of the decision-making process. These steps are: the formulating of objectives (step 1); the choosing of a location as a means to solve the problem (step 2); and the accomplishing of objectives other than those currently held (step 3). Such a procedure follows:

- I. Formulate and structure the objectives for the individual firm. Consider the constraints imposed by the free enterprise system, and necessarily limiting resources of the firm, and other possible limitations. Consider, also, the particular advantages enjoyed by the firm.
- II. With current objectives as standards, measure present performance. Examine whether there is an unacceptable variation from the standards. An unacceptable variation is symptomatic of a problem; corrective measures are, therefore, required.
- III. Remain responsive to changes occurring in the environment. This will insure that future opportunities are recognized even though current objectives are being successfully accomplished. Additional (or other) objectives

may be formulated for the future taking into account these changes in the environment.

The above does not imply that factors other than those directly affecting cost and revenue are unimportant. In fact, it sometimes appears that the main criterion on which the location-decision rests is personal. Personal factors are generally considered in the third step of the decision-making process. The third step is to make the final choice among the satisfactory locations on the basis of personal factors. Personal factors include such considerations as community appearances, churches, recreation facilities, schools, industrial climate, housing, and the availability of transportation. Developmental agencies commonly stress personal factors in their promotional brochures.²¹ Standards with respect to these factors undoubtedly vary more from firm to firm than do standards relating to simple cost factors.²²

Location Theory

The basic literature on location theory, with the exception of von Thunen's theory of agricultural location, has been concerned with the location of manufacturing industry.²³ Location theory is largely

²¹One sometimes wonders if in many cases the attention paid to personal factors in promotional brochures is not done to cover up deficiencies in the availability and cost of inputs.

²²Eva Mueller, Arnold Wilken and Margaret Wood, Location Decisions and Industrial Mobility in Michigan (Ann Arbor, Michigan: The University of Michigan, 1961). In an analysis of the attitudes of Michigan and Ohio manufacturers regarding such factors as industrial climate, labor conditions, and legal climate, it was concluded that meaningful measures of attitudes of firms toward such factors can be made, but that it is a difficult task. Such surveys and analysis require a high degree of training and skill in interviewing procedures.

²³Witald Krzyzanowski, "Review of the Literature of the Location of Industries," Journal of Political Economy, Vol.35 (1927), pp. 278-291.

concerned with the problem of explaining patterns of locations of productive facilities. In general, it consists of a straight forward application of the theory of the firm. The most important attempts to formulate a general theory of industrial location can be credited to Weber,²⁴ Losch,²⁵ Hoover,²⁶ Greenhut,²⁷ and Yaseen.²⁸ The first three deal largely with the theoretical aspects of location and the last two deal somewhat more with the problem of selecting suitable locations. Isard²⁹ integrates location theory into the analysis of regions. He examines optimal spatial distribution of production under the conditions of a nonhomogeneous resource base.

Some contributors emphasize the cost factors in attempting to achieve a theory of industrial location. Others have stressed the demand (market) factors and minimized the role of cost factors. Finally, several writers, notably Greenhut³⁰ have attempted to combine both supply and demand factors.

²⁴ Alfred Weber, Theory of the Location of Industry (Chicago, Illinois: The University of Chicago Press, 1929).

²⁵ August Losch, The Economics of Location (New Haven: Yale University Press, 1954).

²⁶ Edgar M. Hoover, The Location of Economic Activity (New York: McGraw-Hill Book Company, Inc., 1948).

²⁷ Melvin L. Greenhut, Plant Location in Theory and Practice (Chapel Hill: The University of North Carolina Press, 1956).

²⁸ Leonard C. Yaseen, Plant Location (New York: The Book Production Company, Inc., 1956).

²⁹ Walter Isard, "The General Theory of Location and Space Economy," Quarterly Journal of Economics, 63, (1949), pp. 476-506.

³⁰ Melvin L. Greenhut, op. cit.

Cost Orientation

Included in the cost orientation group are those theorists that stress the importance of differences in cost in determining industrial location. While demand has not been completely ignored, it is given a minor role. Generally, three cost elements are distinguished. The first of these is the cost of producing or purchasing required inputs. These costs include both physical and labor inputs. The second is the cost of assembling the inputs at the point of production. This cost element is particularly important for the physical inputs. The third element is the cost of transportation; the cost of shipping the product to market. There are usually differences in all of these elements in various locations. In fact, these cost elements are relevant to the location-decision only if there are differences among various locations.

Von Thunen's theory attempts to explain the types of production that will occur around a given central town.³¹ Basically he regards industrial locations as given, and deduces agricultural locations from them. For a society which engages predominantly in agricultural activities this conceptual framework is useful. By assuming a homogeneous land surface, he finds that particular crops tend to be grown in concentric zones around a single population cluster. A particular agricultural product or combination of products corresponds to each zone. The factors that determine the zone in which each product is produced are (1) the demand for the various products by the given population, (2) the effort involved in transporting a unit of each of the several products over any unit of distance, (3) the intensity and associated cost at which a unit of area can yield each product, and (4) the resulting price or barter ratio.

³¹Melvin L. Greenhut, op. cit., pp. 5 - 8.

Using the above uniformity assumptions von Thunen determines that land rent is lower and transportation costs are higher the further away the location from the town (point of consumption). Consequently, von Thunen's analysis revolves on the cost of transportation and the rent of land in determining why a specific product is grown in a particular zone. The distance from the town that each crop will be grown is determined by minimizing costs, substituting transportation for land rent when moving away from the population cluster, or vice versa when moving toward the center of consumption.

Serious distortions of this concentric pattern results if von Thunen's uniformity assumptions are relaxed and realities such as differentiation in soil, climate and topography and a finite number of transportation routes are introduced. Land devoted to grazing may appear in a wheat-growing zone simply because the topography of the enclave precludes any other activity. In an area stretching along a transport route, cultivation of land may be much more intense than in an area closer to the population cluster but not serviced by transport media. In other words, any physical semblance of zonal arrangement may be completely absent. However, in terms of time-cost distance the concentric zonal arrangement would remain undisturbed.

Contrary to von Thunen, Weber attempts to determine the location of a given industry. Weber tried to develop a general theory of location.

Three primary factors of location are recognized. The first is the cost of transportation. A given branch of an industry will be found in or near the place of consumption in order to minimize cost of

product transportation. If industry moves away from the center of consumption it is due to raw materials which lose weight in the process of production. Therefore by moving to the source of raw materials, the heaviest materials need not be transported. The second factor of location recognized by Weber is the unit cost of labor. The difference in the cost of labor necessary to produce one ton of a commodity at different locations is a cause for the relocation of industry. For the purpose of analyzing this factor, Weber plots lines of equal cost for a certain geographical area. The third factor is the difference in the cost of production due to concentration or dispersion of industries. This Weber calls "agglomeration". This term hides many different forces such as the law of diminishing returns, the advantages of the division of labor, the influence of the transportation media, and basically those forces that denote external economies and diseconomies of scale. This factor is not homogeneous and has been criticized for concealing the imperfection of Weber's analysis.

Weber's analysis assumes several market areas with identical demand curves for all firms in the industry. Consequently, the location of the plant is determined solely by cost considerations. Weber excluded institutional factors such as interest, insurance, and taxes in an attempt to formulate a location theory valid for every type of economic system.

This technique is currently inadequate. It does not present any general principle by which one can order the spatial complexities involved in the total location problem. Nonetheless, this evolutionary approach is useful. It forces us to calculate the various costs involved

in production and compare them with the cost of transporting a unit of the finished product. Weber's approach furnishes a convenient breakdown of costs which is helpful in suggesting lines along which an improved general theory of location may be developed.

Hoover's attempt to formulate a general theory resembles Weber's evolutionary approach.³² Through carefully drawing up a set of assumptions and relaxing them one by one, he is able to proceed from an analysis of extractive industries to a treatment of manufacturing. He first examines the location of these industries under simple conditions and then under more complex ones. He emphasizes the major specific forces at work and does not pay too much attention to general interrelations, especially when they can be stated in broad terms.

...If the factors at work are broken down so minutely that it becomes impossible to formulate rules for their resultant effect, what we have is no more a theory than a heap of bricks is an architectural achievement.³³

In this way he is able to synthesize the various theoretical contributions of his predecessors that are of practical value and by employing illustrative empirical material is able to present a practical approach to industrial location.

In his later study, The Location of Economic Activity, he produces a more penetrating analysis of cost factors as they influence industrial location than he had achieved previously.³⁴ He separates the cost of

³²Edgar M. Hoover, Location Theory and the Shoe and Leather Industries, (Cambridge, Massachusetts, Harvard University Press, 1933). See also, Edgar M. Hoover, "The Location of the Shoe Industry in the United States," op. cit.

³³E.M. Hoover, "The Location of the Shoe Industry in the United States," Quarterly Journal of Economics, Vol.47 (February 1933), p. 276.

³⁴Edgar M. Hoover, The Location of Economic Activity, (New York: McGraw-Hill Book Company, 1948).

location into two groups (1) production factors and (2) transportation factors. In this regard, his theory is similar to Weber's. The location choice again being based on substitution of factors to minimize cost. His approach, however, differs from Weber's in that he explains industrial location in terms of cost factors from which evolves the market area. Cost factors and market factors are not interdependent in Hoover's model as in Weber's:

Hoover endeavors to develop a factor substitution theory of industrial location. Although he refers to market forces he does not integrate them into his explanation of industrial location. He gets around this by assuming that the largest part of consumption is a function of the working force bound to the place of production. Accordingly, he ignores the small part of consumption that is independent of any kind of productive activity. He concludes that a theory of substitution which explains the location of production also includes location due to market forces. Therefore, according to Hoover, industrial location theory must be based on the principle of substitution in the employment of productive factors.

Walter Isard conceives the general theory of location "as embracing the total spatial array of economic activities, with attention paid to the geographic distribution of inputs and outputs and the geographic variation in prices and costs."³⁵ Isard also recognizes the influence of market forces on industrial location, but attributes its value as a

³⁵Walter Isard, Location and Space-Economy, (New York: John Wiley & Sons, Inc., 1960), p. 53.

a location factor to cost of transportation. Several writers have pointed out that while this may be a necessary technique in empirical analysis, it is preferable to treat demand separately in a deductive theory of location.

His basic theory is that the marginal rate of substitution between any two transport inputs must equal the reciprocal of the ratio of their transport rates. Out of this frame work he attempts to determine the optimal transport point for the more generalized case when many raw materials and market points are involved. Isard attempts to state existing location theory in a form comparable to that of production theory. This approach is useful in that location theory can now be examined through substitution transport inputs and all other inputs as a whole. Thus he attempts to construct a more comprehensive framework for both types of theory.

Demand Orientation

Writers who stress the cost aspect of industrial location assume that each firm, irrespective of location, is faced with the same demand curve and market price. This is in contrast to the theorists stressing the influence of market factors.

The influence of demand depends upon the extent to which shifts in the seller's location increase or decrease demand in addition to, or in spite of, changes in price. By changing the location, different prices for a different or more particular group of buyers result. These changes in price and market area may cause a change in the total demand curve for the seller's product. The aim of the entrepreneur is to locate on the site offering lowest delivered prices over the largest available market area.

Englander recognizes that a firm locating at a given site would influence the prices of inputs and outputs in that area.³⁶ He points out that the entrepreneur choosing a plant location considers the supply prices and the prices that he can obtain for his product at the various potential locations. When locating his plant in the chosen area, he in turn will influence the prices of inputs and outputs. Consequently, the pattern of local price differences and the location of economic activity are simultaneously determined by what he calls "local conditionality."

The general theory of "local conditionality" classifies raw materials and factors of production (whether mobile or immobile) as available everywhere under the same conditions. It conceives immobile factors as goods of infinite weight that enter into production with infinite weight-loss. Englander attempts to bring together the specific location theories of industry and agriculture as internally related sectors rather than distinct compartments.

Once we admit the essential reality of a firm's ability to influence prices, we must recognize that price changes by one firm frequently provoke retaliatory measures by other firms. A firm seeking to maximize its profits and to locate at the most desirable site, must consider the possible reactions of other firms. The firm must select its location, set its price and determine its output after considering not only the direct consequences but also the possible indirect repercussions from the reactions of other firms. Englander's theoretical approach does not consider this

³⁶Walter Isard, Ibid., pp. 29-31.

complex oligopolistic situation of reality. There still has not been developed what might be considered a pattern of rational behaviour on the part of the firm in response to possible reactions of other firms and the many uncertainties which becloud the problem. However, Engländer's approach allows a more comprehensive perspective of the space-economy of reality and a finer appreciation of the magnitude of the location problem.

August Losch attempts to formulate a general approach to location by the use of a set of equations.³⁷ Through this set of equations Losch presents a static model of a space economy operating under conditions of monopolistic competition. By abstracting from supply, location is determined by competition for markets. Thus the entrance of competitors compresses the size of each firm's market area.

Losch postulates the following: (1) uniform transportation features in all directions; (2) an even scatter of raw materials in sufficient quantity for infinite production; (3) uniform distribution of population, tastes, and preference; (4) perfect distribution of technical knowledge; and (5) equal production opportunities available to all. His model is based on the assumption that the price of a commodity is a simple function of its demand. At a lower price each consumer will take more and the extent of the firm's market will increase to include more customers, whether or not at the expense of competitors.

It may be claimed that Losch's model has both too many unknowns and too many equations to be useful as a general approach to location.

³⁷August Losch, op. cit.

Losch himself has pointed out that his system of equations shares the weakness of any general theory which is too all-inclusive to be applicable. However, the theoretical framework itself is useful for a number of location problems for which it must, of course, be narrowed down to fit the specific situation.

Other theorists who emphasize the demand factor in industrial location include Hotelling,³⁸ Smithies,³⁹ Lerner and Singer.⁴⁰ By abstracting from supply and postulating various elasticities of demand for the product of an industry, these writers attempt to determine the location of rival firms competing in the same market area.

Market orientation theorists assume that market factors determine an area rather than a point. It may be assumed that in selecting a location site (or plant) within the chosen geographic area, cost is of primary importance. Simply stated, demand determines the area and cost factors determine the site. The findings of several studies of locational decision-making are compatible with this position.⁴¹ They found that the location procedure generally involves selecting a general area, comparing communities within the area, and selecting a site within the community.

³⁸Harold Hotelling, "Stability in Competition", Economic Journal, Vol. 39 (1929), pp. 40-57.

³⁹Arthur F. Smithies, "Optimum Location in Spatial Competition", Journal of Political Economy, Vol. 49 (1941), pp. 423-439.

⁴⁰A. P. Lerner and H. W. Singer, "Some Notes on Duopoly and Spatial Competition", Journal of Political Economy, Vol. 45 (1939), pp. 145-186.

⁴¹G. E. McLaughlin and Stefan Robock, Why Industry Moves South, Washington, D.C., National Planning Association, Committee of the South, (1949), p. 142.

Since cost factors would become important only after the selection of the geographic area, cost considerations would only influence the location choice within the geographic area. This implies that cost factors in different geographic areas do not determine the location of plants, but rather cost factors are important in determining the site within a certain geographic area.

Greenhut can be regarded as a synthesizer in the field of industrial location theory.⁴² He combines the cost and market factors that influence industrial location in formulating his theory. The following quotation expresses the general framework of this theory.

The inclusion of cost and demand factors in one model points out the need for a broader statement of the determinants of plant location than one which concludes that firms seek the location of least cost, or one which holds that firms seek the location offering the largest market area. This need is fulfilled by the concept of maximum-profit location, which by definition may be referred to as that site from which a given number of buyers (whose purchases are required for greatest profits) can be served at the lowest total cost. While the lowest level of average product cost at this site may be higher than that existing at alternative ones, the monopolistic control gained over large numbers of buyers (spread over a market area) makes it the maximum-profit location at the optimum output.⁴³

Greenhut divides location factors into three groups: demand, cost, and "purely personal considerations." While he mentions personal factors in his discussion of location theory, he ignores them in his deductive theory of location. He discusses the possibilities of a general maximum

⁴²Melvin L. Greenhut, Plant Location in Theory and in Practice, op. cit..

⁴³Ibid., p. 267.

satisfaction theory of location which would include nonpecuniary returns as well as maximum profit forces.⁴⁴ The following is a summary of Greenhut's classification.⁴⁵

The demand factors include:

1. The shape of the demand curve for a given product.
2. The location of competitors, which in turn partially determines
 - a. the magnitude of the demand and
 - b. the cross-elasticity of demand at different places.
3. The significance of proximity, type of service, and speed of service.
4. The relationship between personal contacts and sales.
5. The extent of the market area, which itself is partially determined by cost factors and pricing policies.
6. The competitiveness of the industry in location and price; certainty and uncertainty.

Cost factors include:

1. The cost of land, which includes
 - a. the rent of land;
 - b. the tax on land;
 - c. the insurance rates at different sites, which in turn partially depend upon

⁴⁴Ibid., pp. 282-283.

⁴⁵Ibid., pp. 279-281.

- (1) the financial resources,
 - (2) the police and fire protection, and
 - (3) the type of climate.
 - d. the cost of fuel and power, which is partially dependent upon
 - (1) natural resources,
 - (2) topography, and
 - (3) climate.
- 2. The cost of labor and management, which is influenced by
 - a. the health of the community, the park and education facilities, wage differences, etc., and
 - b. state laws.
- 3. The cost of materials and equipment which is partially determined by
 - a. the location of competitors (sellers and buyers),
 - b. the price system in the supply area,
 - c. the extent of the supply area, which in turn is partially dependent upon
 - (1) personal contacts and
 - (2) price policy.
- 4. The cost of transportation which is partially determined by
 - a. the topography,

- b. the transport facilities, and
- c. the characteristics of the product.

The purely personal factors include:

The extent to which the nonpecuniary returns outweighs the quest for maximum profits. This includes

- a. the importance of psychic income (size of plant),
- b. environmental preferences, and
- c. the security motive.

The demand and cost determinants are influential in all site selections. Personal consideration apparently influences the smaller plants more readily than larger plants.

Summary

This chapter is concerned with location theory in general. However, as indicated, each location-decision is unique. There are several reasons for this. First, decisions are made to achieve objectives. Each firm decides for itself the degree of emphasis to place on the social, economic, and personal objectives. Consequently, each industrial firm has its own intimate set of objectives. Therefore, a location-decision by an industrial firm is based upon the predicted achievement of that firm's own, unique objectives. Second, plant location-decisions may be prompted by the desire to solve a problem or to realize a future opportunity. A problem exists because current operations do not adequately achieve present objectives. Third, the environment of any one business firm differs from that of any other. Furthermore, the environment of each business firm also changes with time. Therefore, no two location-decisions are made with the same set of factors controlling the decision.

Objectives are achieved in a business firm through management. The process of management involves (among other things) planning, organizing, and controlling. These functions, in total, will determine the efficiency with which the desired objectives are realized. Decisions must be made as plans are developed. Sound planning requires the consideration of alternative ways to achieve an objective.

Economic location theory has tended to abstract away from costs of production (it has assumed these costs to be constant). Instead, location theory has concentrated on the effect of transportation costs for the finished product. However, both types of costs are important in the location-decision. Quantity requirements for a plant of a specified size are also necessary so that interactions between costs can be evaluated.

There are basically three categories into which location factors can be placed: (1) cost reducing factors; (2) demand factors; and (3) personal factors. All three have been dealt with in this chapter. Personal factors are more difficult to measure. However, it is possible to generalize about the effect of personal factors on the location-decision.

CHAPTER III

METHODOLOGY

Introduction

The primary objective of this survey is to examine the reasons why manufacturers chose Edmonton or Calgary as sites for their plants. This necessitates examining the relative importance that firms attach to certain factors and the extent to which other cities were considered. It is also necessary to determine whether manufacturers in these cities agree upon the factors they consider important. If each of the two groups are homogeneous in their views, they can meaningfully be compared.

Survey Technique

It was decided that a pretested questionnaire would be used to obtain the above data from Edmonton and Calgary firms. In the anticipation that business firms are reluctant to undergo complicated questioning, the questions were generally brief. These questions were ordered and designed to elicit the respondents' consideration of factors other than those listed. After discussing the questions with several members of the Faculty of Business Administration and Commerce, the questionnaire was pretested to discover if manufacturers could understand and answer the questions.

Ten firms randomly chosen from different industries constituted the pilot sample. The executives of these firms were informed that the purpose of the interview was to pretest the questionnaire. All firms in the pilot survey cooperated. These manufacturers were requested to complete the questionnaire and to ask questions regarding any ambiguous aspects.

Provision was also made for further suggestions. Indications were that these executives had little or no difficulty understanding the questions. However, some suggestions were received. Three firms objected to the length of the list of location factors, complaining that there was little choice among five or six of the factors. In general, the questionnaire seemed acceptable to respondents and yielded the desired information.

Some of the suggestions which were received were incorporated into the questionnaire. Then after further consultation with Faculty members, a questionnaire in the form shown in the Appendix to this chapter (pages 37-46) was decided upon.

A covering letter was designed to accompany each questionnaire. The letter explained the purpose of the study and contained features which were meant to attract cooperation. A summary of the results of the survey was promised to all firms requesting a copy. Specimens of the two covering letters are included in the Appendix to this chapter (pages 37 and 42).

Compilation of the Sample Surveyed

The firms surveyed include all Edmonton and Calgary manufacturers who submitted a Manufacturers' Report to the Alberta Bureau of Statistics during the years 1959 and 1966, inclusive.¹ These firms are the source of the field data compiled in Chapter IV. The period 1959 to 1966 is chosen because in 1958 the Alberta Statistics Act was revised. The revised Act requires all Alberta manufacturers to submit an annual Manufacturers'

¹This should not be construed to mean that these firms were established during this period; they merely filed annual Manufacturers' Reports during this time.

Report. All manufacturers are made aware of this requirement, however, no pressure is used to force compliance. The result is that just over 50 percent (319 out of 514 in Edmonton and 228 out of 447 in Calgary) of the firms submit these reports.

Choosing these firms as the sample for the survey should not introduce any bias. This is not a random sample.² We cannot apply any of the statistical methods to evaluate the probabilities of making various kinds of errors. In contrast to probability samples, this sample is referred to as a judgement sample. Judging from the information provided by the Alberta Bureau of Statistics, this sample is representative of Edmonton and Calgary manufacturers.³ The sample consists of over 26 percent (257 of 961) of all manufacturers in Edmonton and Calgary. According to the Bureau of Statistics, the Manufacturers' Reports that are received are representative of industries in these two cities and the size of the firm also plays no part in whether a "Report" is submitted. As in other samples, any predictions, estimations, and conclusions that are made on the basis of this survey apply only to the particular population from which this

²This sample is not random in the statistical sense, that is, random numbers were not used in selecting the sample. All Edmonton and Calgary firms who submitted an Annual Manufacturers' Report to the Alberta Bureau of Statistics during the period 1959-1966 were included in this survey.

³The Alberta Bureau of Statistics did not provide any information on manufacturers who did not complete the Annual Manufacturers' Report. Of the 961 manufacturers in Edmonton and Calgary, information was available for only the 547 firms who completed the Annual Manufacturers' Report. The Alberta Bureau of Statistics claim that there is no evidence that only firms which exhibit certain characteristics submit Manufacturers' Reports. Reports are received from firms in all industries represented in these two cities and the size of the firm plays no part in whether a Report is submitted. (They rate the size of firm by the number of employees.)

sample is obtained. Any generalization to other populations must be preceded by an extremely careful analysis.

Each of the 319 Edmonton firms and the 228 Calgary firms were sent a questionnaire, a covering letter, and a stamped, return-addressed envelope for inclusion of the questionnaire. In the Edmonton survey, 159 were returned, of which 155 were entirely useable. In the Calgary survey, 105 questionnaires were returned, of which 102 were entirely useable.

Procedure Employed

To test the effect of personal contact, all firms in the Edmonton survey received a pre-questionnaire telephone call. The telephone call consisted of simply explaining the purpose of the survey and an attempt to solicit the manufacturers' cooperation. None of the Calgary firms were telephoned. Tables I and II analyse by industry the number of questionnaires sent and the response obtained from Edmonton and Calgary manufacturers. The overall four percent higher response rate experienced in the Edmonton survey cannot be considered significant. If a random sample had been used a statistical comparison would reveal that the difference in the response rate is not significant and due only to chance.⁴ There was no evidence of any other benefits received from personal contact. Edmonton respondents did not provide better or more detailed information.

⁴If the two samples had been random, a test of significance of the difference between these two proportions would give a value of 0.89. Since this value falls between -1.96 and 1.96 (95% confidence level) it indicates that the difference in response to the two surveys is due to chance and not statistically significant.

Response to Edmonton Questionnaire: Analysis by Industries

33.

TABLE II

Response to Calgary Questionnaire : Analysis by Industries

Response	Industry																					
	Number of Firms																					
Total Number of Questionnaires Mailed	16	5	9	8	2	5	3	19	9	4	11	4	35	9	7	23	8	6	15	30	228	
Number Returned Undelivered								1						1		1			1		4	
Number Returned in an Unusable Form													2							1	3	
Number Not Returned	13	3	2	7	2	0	2	13	3	2	4	0	20	3	4	5	5	3	6	22	119	
Total Completed and Returned	3	2	7	1	0	5	1	5	6	2	7	2	15	5	3	17	3	3	8	7	102	
Total Completed as a Percentage of Total Sent Out <u>Minus</u> Number Undeliverable	19	40	78	12	0	100	33	28	67	50	63	50	43	62	43	77	38	50	57	24	46%	

The data from the two surveys was compared by five categories. These were by: (1) extent to which alternatives were considered; (2) industry; (3) size of firm; (4) whether or not firms had previous manufacturing experience; and (5) whether or not consultants were retained.

Results were tabulated by these categories. Qualitative assessments of the open-end questions were made. Particular attention was devoted to question number seven.⁵ These findings are analysed in Chapter IV.

As a guard against creating unnecessary bias, Edmonton respondents were not informed of the Calgary survey and vice-versa. Both were given the impression that the study was only concerned with their particular city.

⁵ Question seven requires these respondents to rank in order of importance the five main factors that influenced them in choosing a location.

APPENDIX TO CHAPTER III

Specimen of Questionnaire and Cover Letter

Herman Kroeker,
Faculty of Business Administration,
University of Alberta,
Edmonton, Alberta.

June 5, 1967.

Dear Sir:

The attached questionnaire, on plant location, has been designed to take only 10 minutes of your time. All the information you provide will be regarded as confidential in that there will be no identification of your particular firm. This research project that I am undertaking will be offered, when completed, to the University of Alberta as a Master of Business Administration thesis.

The objective of this study is to determine what factors have influenced industrial firms to move to, or begin operations in the Edmonton area. The findings of this research will be based on what has actually happened. Please add to your answers any considerations which are not suggested by the questionnaire. A survey such as this is concerned with all industries and will have value only if answers are received from most firms in the various industries. No direct quotation will be taken from your reply.

The success of this study depends heavily upon your cooperation in completing and returning the questionnaire in the self addressed, stamped envelope. Your cooperation will be greatly appreciated.

If any questions arise concerning the questionnaire or the objective of this study, please telephone me at 433-3881 or 432-4339. Dr. L. S. Rosen or Professor C. G. Hoskins at the University of Alberta can be contacted to confirm the validity of this study by telephoning 432-3115.

I will make available a copy of the results of this survey, upon request, to all firms completing this questionnaire.

I thank you in advance for your cooperation.

Yours very truly,

Herman Kroeker.

PLANT LOCATION QUESTIONNAIRE

Your Industry: _____

1. When you set up your Edmonton plant:

(a) Was it a newly created business? _____ Yes _____ No
(Please tick on the appropriate line)

(b) If not, in which city did you previously operate?

(Please Specify) _____

(c) Where did the person (or persons) who made the decision to locate your plant in Edmonton reside immediately prior to establishing the plant in Edmonton?

(Please Specify) _____

2. How did you decide upon Edmonton as the city in which to locate your new plant? Was it: (Please tick one of the following)

_____ Because locating in Edmonton seemed obvious to you and consideration of other cities did not appear justified?

_____ After considering in a general, non-calculated way the possibility of locating in other cities?

_____ After carrying out a feasibility study to determine a detailed, calculated estimate of probable costs and revenue of locating in other cities.

(If you have ticked the first of these three, please omit question 3.)

3. Which other towns or cities did you consider?

(Please Specify) _____

4. Did you hire consultants to advise you upon the best location for your new operations? _____ Yes _____ No
(Please tick on the appropriate line.)

5. If yes, did you accept their (the consultants) advice?

_____ Yes _____ No

6. If not, what were your reasons for rejecting their (the consultants) recommendations?

7. Which were the five most important factors that made you decide to set up your operations in the City of Edmonton?

(Please place a '1', '2', '3', '4', and '5' on the lines opposite the five main factors in the order of their importance.)

(Note: If only two or three factors were important please insert only a '1' and '2', or a '1', '2', and '3', as the case may be.)

- _____ The availability of the type of labor you required.
- _____ The level of the wage rate.
- _____ The ease of combining the management of your new business with any other business you were already operating.
- _____ The strength and attitude of unions.
- _____ The cost of transporting basic material to your plant.
- _____ The cost of transporting your product to customers.
- _____ The nearness to your major markets.
- _____ The lack of competition in the Edmonton area.
- _____ The proximity of local firms to which you could easily subcontract work or which could quickly supply any special requirements you might have.
- _____ The cost of suitable sites or premises.
- _____ The availability of a suitable site or premises in the Edmonton area at the time you were planning your operations.
- _____ The availability of land to expand.
- _____ The cost of utilities and public services.

_____ The tendency of provincial or city public authorities to favour local suppliers.

_____ The incentives offered by governments by way of corporation tax relief, assistance in obtaining funds for investment or provision of sites or premises.

_____ The level of municipal taxes. (After taking into account any tax concession that governments might have granted.)

_____ The availability of required investment capital.

_____ The rate of interest at which investment capital was available.

_____ The fact that you (or your colleagues) were already living in the Edmonton area.

_____ The personal preference of yourself (or colleagues) concerning the area in which you wished to live.

_____ Other reasons (please specify.) _____

8. If you were starting all over again, would you make the same decision concerning the location of your plant? _____ Yes _____ No
(Please tick on the appropriate line.)

9. If yes, what are the main factors that would influence you to make the same decision? _____

10. If not, what are the main factors that would influence you to locate elsewhere? _____

11. Approximately how many persons do you have on the payroll of your Edmonton premises? _____ persons.

12. What product (or products) does your firm produce? _____

Signed: _____

Position: _____

Firm: _____

Date Your Firm Began Operations
in Edmonton _____

Herman Kroeker,
Faculty of Business Administration,
University of Alberta,
Edmonton, Alberta.

June 9, 1967.

Dear Sir:

The attached questionnaire, on plant location, has been designed to take only 10 minutes of your time. All the information you provide will be regarded as confidential in that there will be no identification of your particular firm. This research project that I am undertaking will be offered, when completed, to the University of Alberta as a Master of Business Administration thesis.

The objective of this study is to determine what factors have influenced industrial firms to move to, or begin operations in the Calgary area. The findings of this research will be based on what has actually happened. Please add to your answers any considerations which are not suggested by the questionnaire. A survey such as this is concerned with all industries and will have value only if answers are received from most firms in the various industries. No direct quotation will be taken from your reply.

The success of this study depends heavily upon your cooperation in completing and returning the questionnaire in the self-addressed, stamped envelope. Your cooperation will be greatly appreciated.

The validity of this study can be confirmed by contacting Dr. L. S. Rosen or Professor C. G. Hoskins at the University of Alberta.

I will make available a copy of the results of this survey, upon request, to all firms completing this questionnaire.

I thank you in advance for your cooperation.

Yours very truly,

Herman Kroeker.

PLANT LOCATION QUESTIONNAIRE

Your Industry: _____

1. When you set up your Calgary plant:

(a) Was it a newly created business? _____ Yes _____ No
(Please tick on the appropriate line)

(b) If not, in which city did you previously operate?

(Please Specify) _____

(c) Where did the person (or persons) who made the decision to locate your plant in Calgary reside immediately prior to establishing the plant in Calgary?

(Please Specify) _____

2. How did you decide upon Calgary as the city in which to locate your new plant? Was it: (Please tick one of the following)

_____ Because locating in Calgary seemed obvious to you and consideration of other cities did not appear justified?

_____ After considering in a general, non-calculated way the possibility of locating in other cities?

_____ After carrying out a feasibility study to determine a detailed, calculated estimate of probable costs and revenue of locating in other cities.

(If you have ticked the first of these three, please omit question 3.)

3. Which other towns or cities did you consider?

(Please specify) _____

4. Did you hire consultants to advise you upon the best location for your new operations? _____ Yes _____ No

(Please tick on the appropriate line).

5. If yes, did you accept their (the consultants) advice?

_____ Yes _____ No

6. If not, what were your reasons for rejecting their (the consultants) recommendations?

7. Which were the five most important factors that made you decide to set up your operations in the City of Calgary?

(Please place a '1', '2', '3', '4', and '5' on the lines opposite the five main factors in the order of their importance).

(Note: If only two or three factors were important please insert only a '1' and '2', or a '1', '2', and '3' as the case may be.)

- _____ The availability of the type of labor you required.
- _____ The level of the wage rate.
- _____ The ease of combining the management of your new business with any other business you were already operating.
- _____ The strength and attitude of unions.
- _____ The cost of transporting basic material to your plant.
- _____ The cost of transporting your product to customers.
- _____ The nearness to your major markets.
- _____ The lack of competition in the Calgary area.
- _____ The proximity of local firms to which you could easily subcontract work or which could quickly supply any special requirements you might have.

Question 7 Cont'd.

- _____ The cost of suitable sites or premises.
- _____ The availability of a suitable site or premises in the Calgary area at the time you were planning your operations.
- _____ The availability of land to expand.
- _____ The cost of utilities and public services.
- _____ The tendency of provincial or city public authorities to favour local suppliers.
- _____ The incentives offered by governments by way of corporation tax relief, assistance in obtaining funds for investment or provision of sites or premises.
- _____ The level of municipal taxes. (After taking into account any tax concession that governments might have granted.)
- _____ The availability of required investment capital.
- _____ The rate of interest at which investment capital was available.
- _____ The fact that you (or your colleagues) were already living in the Calgary area.
- _____ The personal preference of yourself (or colleagues) concerning the area in which you wished to live.
- _____ Other reasons (please specify.) _____
- _____
- _____

8. If you were starting all over again, would you make the same decision concerning the location of your plant? _____ Yes _____ No
(Please tick on the appropriate line.)

9. If yes, what are the main factors that would influence you to make the same decision? _____
- _____
- _____

10. If not, what are the main factors that would influence you to locate elsewhere? _____

11. Approximately how many persons do you have on the payroll of your Calgary premises? _____ persons.
12. What product (or products) does your firm produce? _____

Signed: _____

Position: _____

Firm: _____

Date Your Firm Began Operations
in Calgary _____

CHAPTER IV

TABULATION AND ANALYSIS OF DATA OBTAINED FROM THE SURVEY

Introduction

The primary purpose of this survey is to reveal three basic aspects of plant location. These are: (1) to ascertain the extent to which Edmonton and Calgary firms consider alternative sites when making their location-decision; (2) to determine the relative importance of location factors to manufacturers in these two cities; (3) to determine whether or not firms are satisfied with their location now that the results of their decisions are evident.

Responses to questionnaires were received from 155 Edmonton and 102 Calgary manufacturing firms. These results are tabulated and analysed in this chapter. In order to determine differences and similarities between Edmonton and Calgary manufacturers, it is necessary to analyse the data by various criteria. The standards used to analyse the data from this survey are: (1) the extent to which alternative sites were considered; (2) whether or not the plant was newly created; (3) the size of the firm (number of employees); (4) the type of industry; and (5) the extent to which firms had previous manufacturing experience in Canada.

The above criteria are used in order to interrelate the various questions on the questionnaire. Thus, it is possible to determine, for example, whether large firms consider alternative locations to a greater

degree than do small firms; or whether certain types of industries tend to show more concern over possible locations than do other industries. Although other standards could possibly be used, those used adequately serve the purpose of this survey.

Extent to Which Alternative Sites Were Considered

As indicated in Tables III and IV the major portion of the Edmonton and Calgary manufacturing firms (that revealed this information) did not consider alternative locations for their plants (82.5% (109 of 132) and 77.4% (66 of 88) respectively). It appears that most firms in these two cities did not consider the second step in the normative decision-making model ("search and analysis of alternatives").¹ Since this vital step was omitted, it was obviously impossible to continue through the third step ("choice among alternatives"). Therefore, these firms had no mode for evaluating the efficiency of their chosen location.

Thus, most manufacturing firms in Edmonton and Calgary considered only the first step in the decision-making model.² They recognized that a plant could aid them in obtaining their personal and economic objectives. Without further consideration, these people located their plant in the city in which they were presently living. This is substantiated by the replies received to the question "where did the person (or persons) who made the decision to locate your plant in Edmonton (Calgary) reside immediately

¹The three steps in the decision-making model are outlined in chapter two of this study. They are: (1) recognition of the problem and the need for a decision; (2) search and analysis of alternatives; (3) choice among the alternatives.

²See footnote one of this chapter.

TABLE III

Extent to which Firms Locating in Edmonton Considered
Other Cities as Alternative Plant Sites: Analysis by
Whether or Not it was a Newly Created Business

Extent of Consideration(i)	Number and Percentage of Firms			
	Newly Created Business	Not Newly Created Business	Did Not Specify	TOTAL
No consideration of Other Cities	82 (52.9%)	26 (16.9%)	1 (0.6%)	109 (70.4%)
General Consideration of Other Cities	9 (5.8%)		1 (0.6%)	10 (6.4%)
Detailed Examination of Other Cities	8 (5.2%)	5 (3.2%)		13 (8.4%)
Omitted to Specify the Extent of Their Consideration	12 (7.8%)	10 (6.4%)	1 (0.6%)	23 (14.8%)
TOTAL	111 (71.7%)	41 (26.5%)	3 (1.8%)	155 (100.0%)

(i) A fuller description of the extent of consideration appears in the Appendix to Chapter III.

TABLE IV

Extent to which Firms Locating in Calgary Considered
Other Cities as Alternative Plant Sites: Analysis by
Whether or Not it was a Newly Created Business

Extent of Consideration (i)	Number and Percentage of Firms			
	Newly Created Business	Not Newly Created Business	Did not Specify	TOTAL
No Consideration of Other Cities	55 (53.9%)	13 (12.7%)		68 (66.6%)
General Consideration of Other Cities	5 (4.9%)	6 (5.9%)		11 (10.8%)
Detailed Examination of Other Cities	8 (7.9%)	1 (0.9%)		9 (8.8%)
Omitted to Specify the Extent of Their Consideration	8 (7.9%)	5 (4.9%)	1 (1.0%)	14 (13.8%)
TOTAL	76 (74.6%)	25 (24.4%)	1 (1.0%)	102 (100.0%)

(i) A fuller description of the extent of consideration appears in the Appendix to Chapter III.

prior to establishing the plant in Edmonton (Calgary)?" We can, therefore, conclude that if the person (or persons) responsible for locating their plants in Edmonton and Calgary had lived in some other city, their plant would probably have been located in that city. The above implies that there is a chance element in most plant locations. That is, many plants were started in Edmonton and Calgary by people already living in these cities. Had the founder lived in some other city chances are he would also have established his plant there. The corollary to this may be why more outside based firms did not set up in Edmonton or Calgary. We are not able to answer this because a survey type study arbitrarily excludes firms who considered locating in an area but failed to do so.

A large majority of the firms surveyed had operated for several years and must therefore be considered to be relatively successful. This suggests that most cities provide, at least to some degree, a suitable manufacturing environment. However, this should not be interpreted to mean that all cities provide sites that enable efficient operations. Some cities (or areas) may meet manufacturers' objectives much more efficiently than other cities could.

The data indicates that newly created firms (regardless of size) are less likely to search for alternative sites than are firms which were not newly created. Three quarters of the firms that were newly created failed to consider alternative locations. In contrast, of the firms that were not newly created, 63 percent (26 out of 41) of the Edmonton firms and 51 percent (13 out of 25) of the Calgary firms neglected to

analyse alternative sites. The above appears to indicate that Calgary firms are possibly more aware of the importance of considering alternatives in their plant location-decisions.

Of the manufacturers that revealed whether they were newly created, approximately 20 percent (20 of the 101) of Calgary establishments considered alternative sites, whereas, just over 14 percent (22 of the 152) of the Edmonton firms did so. This further denotes that Calgary firms may be more conscious of the importance of proper location-decisions.

One reason for the above finding may be that the firms in the Calgary survey, in the aggregate, were established more recently than those in Edmonton.^{2(a)} Businessmen are possibly becoming more aware of the need for an analytical approach to location planning and therefore the more recent the location-decision the more scientific one would expect the process of decision-making to be. This appears to be true in the macro sense, however, the above is not evident when considering the individual firms.

The Scope of the Search for Alternative Locations

Tables V and VI present the response to the questionnaire by firms which did consider other cities as potential sites. Of the 21 Edmonton manufacturers that did consider other cities, three indicated that they considered only cities outside of Alberta. This suggests that these firms viewed Edmonton as the only possible location in Alberta. Other Alberta cities were not even considered. Ten of the 21 firms considered only other Alberta cities. This would imply that these ten firms were reluctant to establish their plant outside of the Province.

^{2(a)}The questionnaire required the respondent to indicate the year in which his firm was established. In the aggregate Calgary firms were established more recently than were Edmonton firms.

TABLE V

Other Cities Considered by Firms Deciding to Locate
in Edmonton : Analysis by Extent of Consideration

Other Cities Considered	Extent of Consideration		
	General Consideration	Detailed Examination	Total
	Number and Percentage of Firms		
Only Other Alberta Cities	6 (29%)	4 (19%)	10 (48%)
Only Cities Outside Alberta	2 (9%)	1 (5%)	3 (14%)
Both, Cities Inside and Outside Alberta	2 (9%)	6 (29%)	8 (38%)
Total	10 (47%)	11 ⁽ⁱ⁾ (53%)	21(100%)

(i) Two other firms which carried out detailed examinations of other cities omitted to specify which ones.

TABLE VI

Other Cities Considered by Firms Deciding to Locate
in Calgary : Analysis by Extent of Consideration

Other Cities Considered	Extent of Consideration		
	General Consideration	Detailed Examination	Total
	Number and Percentage of Firms		
Only Other Alberta Cities	3 (20%)	4 (27%)	7 (47%)
Only Cities Outside Alberta	2 (13%)	- (-)	2 (13%)
Both, Cities Inside and Outside Alberta	4 (27%)	2 (13%)	6 (40%)
Total	⁽ⁱ⁾ 9 (60%)	⁽ⁱⁱ⁾ 6 (40%)	15 (100%)

(i) Two other firms which considered other cities omitted to specify which cities they considered.

(ii) Three other firms which carried out detailed examinations of other cities omitted to specify which ones.

The eight remaining firms considered cities both within and outside Alberta as possible sites. It is noteworthy that six of the eight firms (75%) carried out detailed investigations of these other cities. It appears that as firms increase their scope of alternatives they also increase the depth to which these alternatives are considered.

In contrast, of the firms that considered only other Alberta cities or only cities outside Alberta as alternative locations, just over 38 percent (5 out of 13) carried out detailed analysis. The results of the Calgary survey agree favorably with the response received from Edmonton manufacturers regarding the above aspect. Tables V and VI reveal that 52 percent (11 out of 21) of Edmonton manufacturers carried out detailed feasibility studies, whereas 40 percent (6 out of 15) of the Calgary firms did so. This finding should not be confused with the results of Tables III and IV. These tables indicate that a higher percentage of Calgary firms gave consideration, both in a general and detailed manner combined, to alternative location possibilities. This may indicate that although Calgary firms tend to consider alternatives more readily, Edmonton firms do so in greater detail.

Size of Firm and the Search for Alternatives

The extent to which firms of various sizes considered other cities as alternative location possibilities is analysed in Tables VII and VIII.

TABLE VII

Extent to Which Firms Locating in Edmonton Considered Other
Cities as Sites for Their Plants: Analysis by Number of Persons Employed

Extent of Consideration	Number of Persons Employed						Total
	Less Than 10	10-29	30-99	100-199	200-499	500-1000	
	Number of Firms						
No Consideration	51	38	12	4	2		109
General Consideration	3	4	2			1	10
Detailed Consideration	5	2	1	1	1	2	13
Did Not Specify Extent of Consideration	11	3	5	1	1	1	23
TOTAL	70	47	20	6	4	4	155

TABLE VIII

Extent to Which Firms Locating in Calgary Considered Other
Cities as Sites for Their Plants: Analysis by Number of Persons Employed

Extent of Consideration	Number of Persons Employed						Total
	Less Than 10	10-29	30-99	100-199	200-499	500-1000	Did Not Specify
	Number of Firms						
No Consideration	34	18	13	2	1		68
General Consideration	3	5	2	1			11
Detailed Consideration	2	4	1	1	1		9
Did Not Specify Extent of Consideration	2	7	3	2			14
TOTAL	41	34	19	6	2		102

Small firms (those employing less than 30 people) seldom considered the possibility of locating in other cities. Only about 14 percent (14 out of 103) of the Edmonton firms and 21 percent (14 out of 66) of the Calgary firms which employed less than 30 people considered other location possibilities. Of the intermediate firms (those employing between 30 and 199 people), 20 percent (4 out of 20) of the Edmonton firms and 25 percent (5 out of 20) of the Calgary firms considered other cities as latent location sites. Although the sample of the larger firms (those employing over 200 people) is relatively small, the survey indicates that large firms search more extensively for location possibilities. Of the firms that revealed this information, over 66 percent (4 out of 6) of the Edmonton manufacturers and 50 percent (1 out of 2) of the Calgary firms which employed over 200 people considered alternatives.

This survey leads to the conclusion that larger firms search more extensively for alternatives than do smaller firms. This result is to be expected because larger firms have greater resources and more specialists, thus enabling them to search for alternatives more extensively.

Effect of Previous Experience on the Search for Alternatives

Tables IX and X indicate what effect previous manufacturing experience has on the search for alternative locations. Only about 16 percent (20 out of 121) of Edmonton manufacturers and just over 13 percent (10 out of 75) of the Calgary firms which had no previous manufacturing experience, considered other possible locations. Experienced manufacturing firms considered other locations more readily. In the Edmonton survey, 24 percent (8 out of 34) of the firms with previous

TABLE IX

Other Cities Considered by Firms Deciding to
Locate in Edmonton: Analysis by Whether the Firm
Had Previous Manufacturing Experience in Canada

Previous Experience	Other Cities Considered						
	None	Only Other Alberta Cities	Only Cities Outside of Alberta	Both Other Cities Inside and Outside Alberta	Considered Other Cities But Did Not Specify Which Ones	Did Not Specify Whether Other Cities Were Considered	TOTAL
	Number of Firms						
None	91	8	4	8	3	7	121
Only in Cities Outside of Alberta	9	4	1	1		4	19
Only in Edmonton	4	1				2	7
Both in Edmonton and in Cities Outside of Alberta							
Only in Other Alberta Cities	6						6
Both in Other Alberta Cities and in Cities Outside Alberta		1			1		2
TOTAL	110	14	5	9	4	13	155

TABLE X

Other Cities Considered by Firms Deciding to
Locate in Calgary: Analysis by Whether the Firm
Had Previous Manufacturing Experience in Canada

Previous Experience	Other Cities Considered						
	None	Only Other Alberta Cities	Only Cities Outside of Alberta	Both Other Cities Inside and Outside Alberta	Consider- ed Other Cities But Did Not Specify Which Ones	Did Not Specify Whether Other Cities Were Con- sidered	TOTAL
	Number of Firms						
None	59	5	3	2	2	4	75
Only in Cities Outside of Alberta	5	4		4	1		14
Only in Calgary	2	1				1	4
Both in Calgary and in Cities Outside of Alberta	1						1
Only in Other Alberta Cities	5				1	1	7
Both in Other Alberta Cities and in Cities Outside Alberta					1		1
TOTAL	72	10	3	6	5	6	102

experience considered other cities prior to locating their plants in Edmonton. Of such Calgary firms, just over 33 percent (9 out of 27) looked to other cities as possible sites for their plants.

It appears that firms with experience are more aware of the advantages to be gained from proper plant location. Also, the survey indicates that experienced manufacturers emphasize economic location factors. This implies that if the economic objectives are adequately realized, the personal objectives can be taken care of. It may also mean that businessmen are willing to substitute personal objectives for greater economic gains. In either case, personal objectives are forced into second place by experienced manufacturers.

Although the search for alternative locations is greater among experienced firms, the scope of this search is very limited. As revealed in tables IX and X, of the firms that did consider other cities, the majority of the manufacturers limited their considerations to either other Alberta cities or to cities outside the Province. An adequate, scientific search for alternatives would include both. Using the above criteria, less than six percent of the Edmonton and Calgary firms (5.8% and 5.9% respectively) undertook an adequate search for alternative locations. It should further be noted that the above percentage includes both general and detailed consideration of other cities as potential sites. Judging from tables VII and VIII, approximately half of the firms which considered other cities did so in detail. Therefore, we must conclude that about three percent, or less (half of 6%) of Edmonton and Calgary manufacturers carried out detailed feasibility plant studies

of alternative potential sites. This data should raise some question about the effectiveness of Alberta's manufacturing plants. Some concern should be given to the possibility of increasing the productivity of manufacturing in Alberta by paying more heed to scientific location decision-making.

In summary, the data from tables IX and X indicate that previous manufacturing experience has a positive effect upon the firm's willingness to investigate the relative attractions of other cities. The scope of the search for alternative sites is, however, very limited. This positive correlation tends to be somewhat stronger among Calgary manufacturers than among Edmonton firms. However, even among experienced manufacturers the scope and depth of the search for alternative sites is dangerously limited.

Differences in the Extent to which "Local People" and "Outside People" Consider Alternative Sites³

One would suspect that "local people" would be more reluctant than "outside people" to consider alternative sites. To test this possibility, firms were asked where the parties responsible for establishing their plants resided immediately prior to its establishment. The answers received are analysed in tables XI and XII.

The responses indicate that "outside people" emphasize economic advantages over personal attractiveness. In order to recognize economic advantages these people are compelled to consider alternative locations.

³The terms "local people" and "outside people" are used in this study to refer to people who have been parties to the location-decision of their new plant. "Local people" are those who resided in the city prior to establishing their plant in that city. "Outside people" are those who did not reside in the city immediately prior to establishing their plant.

TABLE XI

Edmonton Firms with Executives who had Resided in the
City Prior to Establishing Their Plants in Edmonton:

Analysis by Extent of Consideration of Other Cities

Extent of Consideration Of Other Cities	Whether or Not Executives Resided in Edmonton			
	Number and percentage of Firms			
	Yes	No	Did Not Specify	TOTAL
None	66 (42.8)	32 (20.5)	11 (7.1)	109 (70.4)
General Consideration	3 (1.8)	6 (3.9)	1 (0.7)	10 (6.4)
Detailed Examination	5 (3.2)	8 (5.2)		13 (8.4)
Did Not Specify Extent of Their Consideration	11 (7.1)	6 (3.9)	6 (3.8)	23 (14.8)
TOTAL	85 (54.9)	52 (33.5)	18 (11.6)	155 (100)

TABLE XII

Calgary Firms with Executives who had Resided in the
City Prior to Establishing Their Plants in Calgary:

Analysis by Extent of Consideration of Other Cities

Extent of Consideration of Other Cities	Whether or Not Executives Resided in Calgary			
	Number and Percentage of Firms			
	Yes	No	Did Not Specify	TOTAL
None	48 (47.1)	14 (13.6)	6 (5.9)	68 (66.6)
General Consideration	3 (2.9)	8 (7.9)		11 (10.8)
Detailed Examination	4 (3.9)	5 (4.9)		9 (8.8)
Did Not Specify Extent of Their Consideration	7 (6.9)	3 (3.0)	4 (3.9)	14 (13.8)
TOTAL	62 (60.8)	30 (29.4)	10 (9.8)	102 (100)

"Local people", on the other hand, emphasize the personal attractiveness of their cities. These people are aware of the personal advantages offered by their city. If these personal location factors are appealing, "local people" feel less need to search for alternatives. "Local people" may also have first hand knowledge of demand opportunities which are possibly unavailable to outside founders. The greater information available to "local people" probably compensates for extensive searching.

In the Edmonton survey, 27 percent (14 out of 52) of the firms established by "outside people" considered alternative locations. This compares to just over nine percent (8 out of 85) of the plants established by "local people". The responses from Calgary manufacturers indicate even greater differences. Forty-three percent (13 out of 30) of the firms established by "outside people" considered other potentialities. In contrast, only 11 percent (7 out of 62) of the firms instituted by "local people" did so. These surveys indicate that a larger percentage of Calgary manufacturers considered alternative sites. Furthermore, the data supports our supposition that "local people" are more reluctant than "outside people" to consider alternative locations.

Edmonton appears to be slightly favored over Calgary by firms that considered alternative cities. Thirty-three percent of Edmonton plants as compared to 29 percent of Calgary plants were established by "outside people". "Nearness to markets" seems to be the reason why Edmonton is preferred. One possible explanation for this may be the development of the North. Alberta's center of population is constantly moving northward.

Presently, it is just south of Edmonton.⁴ Therefore, considering Alberta as the market, Edmonton is nearer the center of the market than is Calgary. Thus, in cases where Edmonton was preferred to Calgary, firms may have, considered this northward movement of Alberta's population. This indicates that some firms may be placing more emphasis upon proper location-decisions.

However, the majority of Edmonton and Calgary manufacturers surveyed, did not consider alternative locations. Even "outside people" limited their search. Sixty-two percent (32 out of 52) of such Edmonton firms and 47 percent (14 out of 30) of such Calgary firms considered no alternative sites. Our conclusion is that although "outside people" are more willing to search for alternative locations, the scope and depth of their search is still very limited.

Extent to Which Various Industries Searched for Alternative Locations

The lack of search for alternative locations is general to all manufacturing industries. Only a minority of firms examined other potentialities. Even fewer firms examined these alternatives in detail. Tables XIII and XIV analyse by industry the extent to which other cities were considered.

The Beverage, Chemical, and Machinery industries indicated the greatest willingness to examine alternative locations. These industries also contain the greatest percentage of large firms. In these industries the proportion of firms that undertook detailed studies ranged from

⁴Alberta Bureau of Statistics, personal interview with Dalton Tamny, Market Research Officer, July 25, 1967.

TABLE XIII

Extent to Which Firms Locating in Edmonton Considered Other
Cities as Sites for Their Plants: Analysis by Industry

Industry	Extent of Consideration				Total
	No Consideration	General Consideration	Detailed Examination	Did Not Specify	
	Number of Firms				
Bakery Products	10	2	1	1	14
Beverage Manufacturers . . .	1	-	1	-	2
Chemical Products	5	1	1	1	8
Clothing Industry	2	1	-	-	3
Dairy Products	2	-	-	-	2
Electrical Products	-	-	-	-	-
Other Food Products	-	-	-	1	1
Furniture and Fixtures . . .	8	1	-	-	9
Grain Mills	-	-	-	-	-
Leather Products	-	-	-	-	-
Machinery Industry	3	-	1	-	4
Meat Processing	1	-	-	-	1
Metal Fabrication	29	-	-	9	38
Non-Metallic Minerals	9	-	1	1	11
Paper Products	1	-	-	-	1
Petroleum Products	1	-	-	1	2
Primary Metal Industry . . .	1	-	-	-	1
Printing and Publishing . . .	13	-	2	3	18
Transportation Equipment . .	7	2	-	-	9
Wood Industry	9	-	-	-	9
Miscellaneous	9	2	6	5	22
TOTAL	111	9	13	22	155

TABLE XIV

Extent to Which Firms Locating in Calgary Considered Other
Cities as Sites for Their Plants: Analysis by Industry

Industry	Extent of Consideration				Total
	No Consideration	General Consideration	Detailed Examination	Did Not Specify	
	Number of Firms				
Bakery Products	2	1	-	-	3
Beverage Manufacturers	-	-	1	1	2
Chemical Products	4	1	2	-	7
Clothing Industry	-	-	-	1	1
Dairy Products	-	-	-	-	-
Electrical Products	3	2	-	-	5
Other Food Products	1	-	-	-	1
Furniture and Fixtures	3	1	1	-	5
Grain Mills	4	-	1	1	6
Leather Products	1	-	-	1	2
Machinery Industry	3	1	1	2	7
Meat Processing	2	-	-	-	2
Metal Fabrication	13	-	1	1	15
Non-Metallic Minerals	3	1	1	-	5
Paper Products	2	-	-	1	3
Petroleum Products	-	-	-	-	-
Primary Metal Industry	2	1	-	-	3
Printing and Publishing	11	1	-	5	17
Transportation Equipment . . .	2	-	1	-	3
Wood Industry	6	1	-	1	8
Miscellaneous	6	1	-	-	7
TOTAL	68	11	9	14	102

13 percent to 50 percent. These relatively high percentages, however, only account for a small number of firms, due to the few sample firms in these industries. Conclusions drawn from such a small sample may be unreliable. However, indications are that these industries show more willingness to examine alternative sites. This finding supports the data analyzed in tables VII and VIII (the larger the firm the more extensive the search for alternative sites).

Factors of Location

An industrial location factor is a decision criterion. It is the reason, or an influential part of the sum-total of reasons, why a decision to locate a plant is made. As such, location factors are useful in the evaluation of alternative plant locations.

In relation to location factors, this survey attempts to determine: (1) the factors that influenced firms to move to or begin operations in Edmonton or Calgary; (2) the relative importance of these factors; and (3) the differences, if any, that existed between Edmonton and Calgary manufacturers regarding these factors.

Factors that were instrumental in establishing plants in Edmonton and Calgary are analysed in tables XV and XVI. These factors can be placed in two broad categories.^{4(a)} These are: (1) cost reducing factors; and (2) personal factors. In both surveys, the former category received 74 percent (694 out of 935) of the total weight and the personal factors received the remaining 26 percent. If only decisive (primary) factors are considered, then personal factors account for 30 percent (75 out of 248) of the total weight.

^{4(a)} The demand factors [(1) nearness to your major markets, and (2) the lack of competition in the Edmonton (Calgary) area] also include cost, therefore, the two broad categories are cost and personal factors.

Reasons Why Calgary Firms Chose Present Sites for Their New Plants: Analysis by Extent to Which They Considered Other Cities

71.

The apparent heavier weight given to the cost reducing factors is because 16 of the 20 factors listed are cost reducing. The single most important factor is personal. Firms that did not consider alternative sites emphasized personal factors. In contrast, firms that examined other possibilities in detail tended to emphasize cost reducing factors. It follows that, since the majority of the firms only considered one city, the most important factor would be personal.

In total, for all industries in the Edmonton sample, the relative importance of location factors are as follows:

1. The fact that the decision-maker resided in Edmonton prior to establishing the plant.
2. The nearness of major markets.
3. The lack of competition in the Edmonton area.
4. The availability of the type of labor required.
5. The ease of combining the management of their new business with other businesses they were already operating.

The above five location factors were considered important by 55 percent (304 out of 551) of the Edmonton and Calgary manufacturers. (This is the number of times a certain factor was mentioned as a reason for location.)

In the Calgary survey, the relative importance of the location factors are:

1. The nearness of major markets.
2. The fact that the decision-maker resided in Calgary prior to establishing the plant.

3. The lack of competition in the Calgary area.
4. The ease of combining the management of their new business with other businesses they were already operating.
5. The cost of transporting their product to customers.

The above five factors received 57 percent (219 out of 384) of the total weight in the Calgary survey.

In the Edmonton survey, the above five location factors were considered the decisive factors by 82 percent (121 out of 148) of the manufacturers. These same factors were considered influencing factors by 45 percent (183 out of 403) of the firms. Similar results were obtained from the Calgary sample. The five most important location factors were considered decisive by 77 percent (77 out of 100) of Calgary manufacturers and as influencing factors by 50 percent (142 out of 284) of the firms. In total, these five factors exceeded the importance of all other factors considered.

The establishment of plants by people already residing in the city ranks high as a location factor. This factor ranks first in Edmonton and is tied for first place in Calgary.⁵ Twenty-eight percent (42 out of 148) of Edmonton manufacturers considered the fact that they were already living in Edmonton as the primary reason for locating their plant in this city. This factor was included by an additional 12 percent

⁵The reason why this factor does not head the Calgary list is because it received primary consideration less frequently than "nearness to major markets" did.

(49 out of 403) as an influencing reason. In Calgary, the above factor received primary consideration by 21 percent of the firms. An additional 16 percent viewed it as influential. The reason for the importance of this factor is that a large percentage of the firms in the two surveys were established by "local people". (55 percent of Edmonton and 60 percent of Calgary firms were thus established.)⁶ Many of these firms are relatively small. It is, therefore, not surprising that this personal aspect of plant location is strongly emphasized.

"Nearness to major markets" received primary consideration by 26 percent (21 out of 77) of Calgary manufacturers. This factor ranks first on the Calgary list. Edmonton firms weighted "nearness to markets" as the second most important factor. Twenty-two percent (33 out of 148) of Edmonton firms considered this factor to be the decisive factor.

One reason why "nearness to markets" ranks so prominently may be that firms failed to distinguish between this factor and "cost of transporting product to market". This indicates a weakness in the questionnaire. These two factors are not mutually exclusive and should possibly have been incorporated into one question. Future research on plant location should attempt to distinguish between these factors. In addition to lower transportation costs, "nearness to markets" provides several personal advantages. Close consumer contact: aids consumer relationships; aids sales; aids management in detecting changes in consumer tastes; aids the handling of consumer grievances; and aids consumer credit evaluation. In retrospect, it is doubtful that most firms recognized these alleged personal advantages offered by "nearness to markets". Other factors that have common aspects and, therefore, are not mutually exclusive are: (1) "the

⁶See tables XI and XII in this chapter.

level of the wage rate" and "the strength of unions"; (2) "the ease of combining the management of your new business with any other business you are already operating" and "the fact that you are already living in the Edmonton (Calgary) area"; (3) "the tendency of public authorities to favor local suppliers" and "the level of municipal taxes". Since these factors are not mutually exclusive they should possibly also have been incorporated into one question. In order to prevent this weakness in future studies of this type, care should be taken to compile a list of factors that are mutually exclusive and yet detailed enough to be applicable to all firms in the various industries.

The lack of competition is the third most important location factor. This is common to both surveys. This factor was acknowledged by 52 Edmonton firms and by 37 Calgary firms. It was regarded more often as an influencing rather than a decisive factor. The relative importance of "lack of competition" indicated industrial growth. A new manufacturing firm may represent a new industry in the area. Firms locating in an industrially mature city would probably not experience this lack of competition. Most feasible industries would already be represented. The majority of Edmonton and Calgary manufacturing industries can, therefore, be considered to be in the developmental stage.

Availability of labor ranks fourth in importance in the Edmonton survey. Calgary manufacturers do not consider this factor important. It ranks tenth on the Calgary list. This difference in importance reflects imperfect mobility of labor between these two neighboring cities.

Combining the management of new plants with other businesses already operating was relatively important. This factor ranks fourth and fifth, respectively, in the Calgary and Edmonton surveys. It is noteworthy that of the firms considering this factor, a greater percentage considered it primary rather than influencing. This indicates a tendency toward branch operations or diversification. Furthermore, the relative importance of "combining management" might indicate a lack of high

caliber managers. These men are also expensive. It may therefore be a matter of economics that causes firms to combine the management of two or more operations.

Cost of product transportation ranks fifth in importance among Calgary firms. This factor is not included among the five most important by Edmonton firms. This difference in the two surveys is surprising. As mentioned previously, Edmonton is nearer to the center of Alberta's population. One would therefore expect that lower transportation costs would be a reason given for locating in Edmonton.

The greater importance of this factor to Calgary firms may indicate that Calgary manufacturers are mainly concerned with the southern Alberta market. It may also be possible that due to higher transportation costs this factor is of greater significance and thus mentioned as a reason for locating in Calgary. Edmonton firms were probably less aware of transportation costs.⁷ It is noteworthy that transportation was seldom mentioned as a primary factor.

Differences Among Industries

Tables XVII and XVIII analyse by industry the relative importance of location factors. The data received from respondents indicates three variants in location factors. These are: (1) factors are numerous; inter-relationships are extremely complex; the effects, therefore,

⁷Although not evidenced in the pilot survey, there is the possibility that some firms are adversely affected by certain location factors and list these as factors important to them. This possibility indicates a further weakness in the questionnaire. To prevent this defect in future location studies, the researcher should emphasize that positive rather than negative factors are to be listed.

Table XVII

First, Second, Third, Fourth, and Fifth Reasons for Locating in Edmonton:
Analysis by Industry

Industry

Factor	Bakery Products					Beverage Manufacturers					Chemical Products					Clothing Industry					Dairy Products				
	Ranking of Reasons																								
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Availability of Labor	1	1	1	1					1								1	1							
Wage Rate										1					2										
Combining Management			1								1					1	1				1				
Strength of Unions				1							1														
Cost of Transporting																									
Basic Materials	1	1			2		1	1			1	1											1		
Cost of Production Transportation	2	1	1				1	1			1	1	3												
Nearness to Major Markets	1	2		1		2					2		1	2		1		1							
Lack of Competition	2		1	1							2	1	2				1	1							
Local Auxiliary Firms	1		1	1								1	1												
Cost of Sites			2														1								
Availability of Sites	1	1	1		1						1	1								1	1				
Availability of Land to Expand									2									1				1			
Cost of Utilities				2																					
Government Authorities who																									
Favor Local Suppliers												1										1			
Municipal Taxation															1										
Availability of Capital	1																								
Interest Rates	1																								
Already Living in Area	5	2	1		3						2			1		1				1				1	
Personal Preferences	1	2	1	2									1							1					
Other Reasons									1		1		1							1					
TOTAL	15	12	10	9	6	2	2	2	2	2	9	8	8	5	3		3	4	3	2	2	2	2	1	0

TABLE XVII (Continued)

First, Second, Third, Fourth and Fifth Reasons for Locating in Edmonton:

Analysis by Industry

Industry

Factor	Other Food Products					Furniture and Fixtures					Grain Mills					Machinery Products					Meat Processing				
	Ranking of Reasons					Ranking of Reasons					Ranking of Reasons					Ranking of Reasons					Ranking of Reasons				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Availability of Labor						1		1								1			1		1				
Wage Rate							1											1				1			
Combining Management	1					2		1								1		2							
Strength of Unions		1					1			1															
Cost of Transporting																									
Basic Materials																							1		
Cost of Production Transportation										1						2								1	
Nearness to Major Markets						2											3								1
Lack of Competition						3	1											1							
Local Auxiliary Firms										1															
Cost of Sites										1															
Availability of Sites										1															
Availability of Land to Expand										1									1						
Cost of Utilities																									
Government Authorities who																									
Favor Local Suppliers																									
Municipal Taxation																									
Availability of Capital																									
Interest Rates																									
Already Living in Area						2	2	1																	
Personal Preferences							1	1																	
Other Reasons							2																		
TOTAL	1	1	1	0	0	10	8	6	3	2						4	4	3	3	2	1	1	1	1	1

TABLE XVII (Continued)

First, Second, Third, Fourth and Fifth Reasons for Locating in Edmonton:
Analysis by Industry

Industry

Factor	Printing and Publishing					Transportation Equipment					Wood Industry					Miscellaneous					TOTAL	
	Ranking of Reasons																					
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	Primary	Influen- cing					
Availability of Labor		1	3	1					1	1		2					1	1	3	1	7	35
Wage Rate				1															1	1	-	14
Combining Management	4	1				1	2				1						1	1	1		19	21
Strength of Unions									1	2											-	7
Cost of Transporting																						
Basic Materials									1			2		1			1	1	2	1	5	21
Cost of Production Transportation								1	1									2	2	1	5	34
Nearness to Major Markets		4	1	1		3	3		2		2	3	1			7	1	2	2		33	46
Lack of Competition	3	2	2			2		1			1		1			2	3	2	1	1	20	32
Local Auxiliary Firms		1	1	2	1			2			1		2					1			4	24
Cost of Sites												2					1		1	1	1	14
Availability of Sites		2		2				1		1			1			1	3	1	1	3	5	30
Availability of Land to Expand .														1					1	2	-	7
Cost of Utilities																1	1	1			-	8
Government Authorities who																						
Favor Local Suppliers											1						1		1		1	6
Municipal Taxation																		1	1		-	5
Availability of Capital	1		2	1			1											1			1	9
Interest Rates																					-	-
Already Living in Area	8	1	3	1	3	3	1	1				2	4	1	1	6	1	2		1	42	49
Personal Preferences		1			1			1								1	2			1	2	28
Other Reasons	1	1						1	1							1	1			3		13
TOTAL	17	14	12	9	5	9	8	8	6	5	8	9	9	3	4	21	20	17	14	10	148	403

TABLE XVIII

First, Second, Third, Fourth, and Fifth Reasons for Locating
in Calgary: Analysis by Industry

Factor	Bakery Products					Beverage Manufacturers					Chemical Products					Clothing Industry					Electrical Products				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Availability of Labor			1												1		1						1	1	
Wage Rate																								1	
Combining Management											2	1		1							1		1		1
Strength of Unions	1																								
Cost of Transporting																									
Basic Materials					2						2		2								1	1			
Cost of Product Transportation					1						1	5													
Nearness to Major Markets				3		1					2	1	3								3	1			
Lack of Competition	1															1					1		1		
Local Auxiliary Firms							1						1	2											
Cost of Sites	1							1																	
Availability of Sites			2				1	1					1												1
Availability of Land to Expand																									
Cost of Utilities														1											
Government Authorities who																									
Favor Local Suppliers													1					1							
Municipal Taxation																									
Availability of Capital								1																	1
Interest Rates																									
Already Living in Area	1														3		1				1	2			1
Personal Preference	1	1											1								1		1		
Other Reasons									1														1		
TOTAL	3	3	3	3	3	2	2	2	1	0	7	7	7	6	4	1	1	1	1	0	5	5	5	5	4

TABLE XVIII (Continued)

First, Second, Third, Fourth and Fifth Reasons for Locating
In Calgary: Analysis by Industry

Factor	Other Food Products					Furniture and Fixtures					Grain Mills					Leather Products					Machinery Products				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Availability of Labor																									
Wage Rate						1																			
Combining Management							1														1				
Strength of Unions																									
Cost of Transporting																									
Basic Materials											1	1	2									1	1		
Cost of Product Transportation								2			1	3													1
Nearness to Major Markets . .						1	1				1			2							2	1			
Lack of Competition						1		1				1				1									
Local Auxiliary Firms																						2			
Cost of Sites							1																		
Availability of Sites										1							1								
Availability of Land to Expand													1												
Cost of Utilities																									
Government Authorities Who																									
Favor Local Suppliers . . .																									
Municipal Taxation																									
Availability of Capital																							1		
Interest Rates																									
Already Living in Area						2											1	1			2	1	1	1	
Personal Preference							1											1				1	1	1	1
Other Reasons											1		1								2	1			
TOTAL	0	0	0	0	0	5	4	3	2	1	5	5	4	4	3	2	2	1	0	0	7	6	4	4	2

TABLE XVIII (Continued)

First, Second, Third, Fourth and Fifth Reasons for Locating
in Calgary: Analysis by Industry

Factor	Meat Processing					Metal Fabrication					Non-Metallic Minerals					Paper Products					Primary Metal Industry				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Availability of Labor						1	2	1	1													1			
Wage Rate							1			1										1					
Combining Management						2				1	1	1													
Strength of Unions													1												
Cost of Transporting																									
Basic Materials		2											1												
Cost of Product Transportation			1				1		1	1		1										1			
Nearness to Major Markets	1					6	2	1		1	2	1					1	1				1	1		
Lack of Competition			1				2	5	1			3						1				2			
Local Auxiliary Firms						1	2	2	1				1											1	
Cost of Sites									1																
Availability of Sites				1		1		1	1		1											1			
Availability of Land to Expand										1			1												
Cost of Utilities																									
Government Authorities who																									
Favor Local Suppliers																	1								
Municipal Taxation																									
Availability of Capital					1		1																		1
Interest Rates																									
Already Living in Area						4	3	1	2	2	1		1	2							1		1		
Personal Preference							1	2	1		1														
Other Reasons	1																								
TOTAL	2	2	2	1	1	15	15	13	10	7	5	5	5	4	3	3	2	2	2	1	3	3	3	1	1

TABLE XVIII (Continued)

First, Second, Third, Fourth and Fifth Reasons for Locating
in Calgary: Analysis by Industry

Factor	Printing and Publishing					Transportation Equipment					Wood Industry					Miscellaneous					TOTAL Primary Reasons Influencing Reasons	
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5		
Availability of Labor	1		2			1	1	1													3	16
Wage Rate														1							1	6
Combining Management	4	1	1	1		1					2					1	2				17	15
Strength of Unions										1											-	2
Cost of Transporting																						
Basic Materials		1									1	2		1							5	19
Cost of Product Transportation			1					1					3					1			3	26
Nearness to Major Markets	1	5	3	2		1	1				3	2	2			1		1			25	38
Lack of Competition	2	1	1	1	1			1				1	1			2	2				11	26
Local Auxiliary Firms		1		1			1	2				1	1		1	1					1	23
Cost of Sites															1						-	5
Availability of Sites		1	3		1								1			1		1	1		3	20
Availability of Land to Expand				1																	-	5
Cost of Utilities																					-	1
Government Authorities Who																						
Favor Local Suppliers					1																-	4
Municipal Taxation																					-	-
Availability of Capital			2	1	1					1										1	0	12
Interest Rates																					-	-
Already Living in Area	6	3	1		2						1	3	1		2	2	1	1	1		23	39
Personal Preference	2	2	1	1									1				1				4	22
Other Reasons										1											4	5
TOTAL	16	15	15	8	6	3	3	3	3	3	7	8	7	5	2	7	7	4	3	1	100	284

of any one factor are difficult to measure; (2) factors are related to economic costs of acquiring inputs and distributing outputs; (3) factors are both economic and non-economic. Non-economic factors are political, geographical, and individualistic in nature.

Location factors are numerous. Thirty-four factors were reported by Edmonton firms and 29 by Calgary firms. This is to be expected. Location factors are related to the individual objectives of manufacturers. The main purpose for a plant is to aid in attaining these objectives, whether economic or personal. The objectives of manufacturers vary, depending upon the economic, social, and personal values of the individual. Furthermore, every manufacturer faces peculiar problems and opportunities. These problems and opportunities must be met within particular economic constraints. It follows that each firm has indigenous reasons for requiring a plant. The ideal location is one which satisfies these requirements most effectively. Consequently, in the aggregate, location factors are diverse and numerous.

The inter-relationships of locations factors are complex. The general feeling was that locations were chosen as a result of a combination of factors. The primary factor was most easily recognized, however, the influencing factors were less distinct. As pointed out by management theory, business objectives are social, economic, and personal. Firms must, therefore, choose a set of location factors that best aid these firms in attaining all aspects of their objectives. It appears that the majority of Edmonton and Calgary firms did not specify precisely what their objectives were. Hence, less importance was placed in choosing the set of location factors that would best aid the attainment of their objectives.

Of the industries surveyed, it appears that the bakeries, the non-metallic minerals, and the printing and publishing industries emphasize personal location factors. Most of the firms in these industries are small and were established by "local people". "Local people", as previously mentioned, emphasize the personal aspects of plant location.

"Nearness to major markets" was emphasized by the beverage industry. This is a highly competitive industry and close consumer contact is of great importance to firms in this industry. "Nearness to markets", apart from lower transportation costs, has the following advantages: (1) it builds up personal relationships with consumers; (2) it enables firms to detect changes in consumer tastes; and (3) it gives firms early warning of any threat from competitors. These advantages permit the firm to take the necessary corrective action. It is, therefore, not surprising that firms in this industry emphasize "nearness to markets".

Cost of product transportation appears important to the Chemical, Grain-mills, Meat processing, and Wood industries. Cost of transporting raw materials also ranks high. The reason for the emphasis on transportation is that products in these industries are heavy and bulky. Also, the raw materials tend to have a low value-weight ratio. In addition, the chemical and meat products often require refrigerated transportation. These are some of the reasons advanced for the importance of transportation to these industries.

The firms comprising the Fabrication Metals industry were influenced in their location-decision by two main factors: (1) nearness to markets; and (2) the fact that the decision-maker was already living

in the city. Most firms in this industry manufacture consumer-specified products. That is to say, products are produced to meet individual consumer specifications. The advantages of close consumer contact for such firms are obvious. Somewhat more surprising is the emphasis placed on the second location factor. Firms in this industry require technical know-how. One would suspect qualified technicians to emphasize economic rather than personal advantages. One explanation may be that these firms began as one-man operations and increased in size and caliber to meet the demands for their product.

In summary, the foregoing tables indicate the variation of emphasis placed on location factors. This diversity exists not only among industries but also among firms in the same industry.

Location Factors That Attract Manufacturers to Edmonton and Calgary

Of the firms which considered alternative sites, what factors attracted them to Edmonton and Calgary? Tables XIX and XX analyze the reasons by industry. The number of firms in each industry which considered alternative locations is very small.

Basing our conclusion on this small percentage may be misleading. However, some factors are evident. "Nearness to major markets" is overwhelmingly the most important factor. "Cost of product transportation" is next, but is mentioned only half as frequently as "nearness to major markets". "Lack of competition" and "combining management" rank third and are of about equal importance.

The significance of this finding is that the majority of firms which do not consider alternative locations also emphasized these same factors. The one difference is that "residence of owner" was most

Reasons Why Edmonton Firms Which Considered Other Cities Chose Present Sites for Their Plants: Analysis by Industry

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TABLE XX

Reasons Why Calgary Firms Which Considered Other Cities Chose
Present Sites for Their Plants: Analysis by Industry

Reason	Industry																				
	Bakery	Beverages	Chemical	Clothing	Dairy	Electrical Products	Furniture and Fixtures	Grain Mills	Leather	Machinery	Meat Processing	Metal Fab.	Non-Metallic Minerals	Paper Products	Primary Metals	Petroleum	Printing and Publishing	Transportation	Wood Industry	Miscellaneous	TOTAL
Number of Times Reason Given as One of Five Most Important																					
Availability of Labor			1			1						1						1			4
Wage Rate							1					1		1							3
Combining Management			1			1	1	1					1				2	1		1	9
Strength of Unions																					-
Cost of Transporting																					
Basic Materials	1		2			1		1		1			1	1					1		9
Cost of Product Transportation			2				1	1		1			1	1	1				1		9
Nearness to Major Markets	1	1	3			1	1	1		1		1	1	1			2		1	1	16
Lack of Competition															1		2			1	4
Local Auxiliary Firms						1												1			2
Cost of Sites	1						1	1											1		4
Availability of Sites	1	1				1							1	1	1		1		1		8
Availability of Land to Expand													1								1
Cost of Utilities			1																		1
Government Authorities Who																					
Favor Local Suppliers			1														1				2
Government Incentives																					-
Municipal Taxation																					-
Availability of Capital		1								1							1	1			4
Interest Rate																					-
Already Living in Area						1				1		1	2				2			2	9
Personal Preferences	1		1			1				1			1				1			2	8
Other Reasons		1								1								1			3
TOTAL	5	4	12	-	-	8	5	5	-	7	-	4	9	5	3	-	12	5	5	7	96

important to these firms. Among firms that considered alternatives, "residence of owner" is seldom mentioned.

Effect of Retaining Consultants

The extent to which firms engaged consultants to advise them on plant location is shown in Tables XXI and XXII. Only two Edmonton and two Calgary firms sought such advice. It is not possible to draw any meaningful inferences from such a small sample. It is noteworthy, however, that the location factors considered important by these consultants are the same economic factors that influenced the majority of the other firms to locate their plants. These factors are: (1) nearness to markets; (2) lack of competition; and (3) the cost of product transportation. Personal location factors depend largely upon the value judgement of the decision-maker. It is obvious that non-interest groups (consultants) could not take these personal factors into consideration.

Satisfaction with Present Location

The last two tables analyse the extent of satisfaction that is experienced by firms now that the results of their location-decisions are evident. The Edmonton survey indicates that firms which considered other cities are less happy with their location. Sixty-five percent (15 out of 23) of such firms were satisfied. Of the manufacturers that did not consider alternatives, 80 percent (88 out of 109) expressed satisfaction. One reason for their greater satisfaction may be that firms which did not consider alternative sites are less aware of the results they might have achieved elsewhere. Furthermore, these firms probably did not quantify the results of locating in their particular city.

TABLE XXI

Firms Which Did or Did Not Retain Consultants to Advise
Them on Locating Their Plants in Edmonton: Analysis by
Number of Persons Employed

	Number of Persons Employed						Total
	Less Than 10	10-29	30-99	100-199	200-499	500-1000	
	Number of Firms						
Consultants Retained	2						2
Consultants Not Retained	68	47	20	5	4	4	151
TOTAL	70	47	20	5	4	4	153 ⁽ⁱ⁾

(i) Two firms omitted to say if they retained consultants.

TABLE XXII

Firms Which Did or Did Not Retain Consultants to Advise
Them on Locating Their Plants in Calgary: Analysis by
Number of Persons Employed

	Number of Persons Employed						Did Not Specify Total
	Less Than 10	10-29	30-99	100-199	200-499	500-1000	
	Number of Firms						
Consultants Retained		1			1		2
Consultants Not Retained	41	31	19	5	1		97
TOTAL	41	32	19	5	2		99 ⁽ⁱ⁾

(i) Three firms omitted to say if they retained consultants.

TABLE XXIII

Satisfaction With Present Plant Location Among Edmonton
Manufacturers: Analysis by Degree of Consideration

If Starting All Over Again	No Consideration	General Consideration	Detailed Examination	Did Not Specify	TOTAL
Would Make The Same Decision Again	88	6	9	15	118
Would Not Make The Same Decision Again	19	3	2	3	27
Did Not Know	1	-	1	-	2
Did Not Specify	1	1	1	5	8
TOTAL	109	10	13	23	155

TABLE XXIV

Satisfaction With Present Plant Location Among Calgary
Manufacturers: Analysis by Degree of Consideration

If Starting All Over Again	No Consideration	General Consideration	Detailed Examination	Did Not Specify	TOTAL
Would Make The Same Decision Again	58	9	8	12	87
Would Not Make Same Decision Again	10	2	1	2	15
Did Not Know	-	-	-	-	-
Did Not Specify	-	-	-	-	-
TOTAL	68	11	9	14	102

The Calgary survey indicates that firms were equally satisfied with their location whether or not alternative sites had been considered. In both cases, 85 percent of the firms would make the same decision if obliged to relocate.

This survey, therefore, gives no indication that the consideration of alternative sites increases the satisfaction with present plants. Further research is required to determine whether the location chosen by firms which considered alternative sites are fulfilling the objectives of manufacturers more efficiently.

Summary

This study did not obtain any data from manufacturers who did not submit an Annual Manufacturers' Report. Therefore, there is no statistical proof that our sample is typical of Edmonton and Calgary manufacturers. There are, however, some indications that the firms analysed in this survey may be representative of manufacturers in these two cities. According to the Alberta Bureau of Statistics, (1) the firms surveyed are representative of manufacturing industries in these two cities; (2) the sample included firms of all sizes (measured by number of employees); and (3) the responses did not indicate that only firms with certain characteristics replied. As in other studies of this type, any projections or conclusions that are based on this survey apply only to the population from which these samples are obtained. If we project from our samples to the Edmonton and Calgary population, indications are that 69 percent (177 out of 257) of new manufacturing plants in Edmonton and Calgary consider no other cities as possible location sites. To them, the choice of city seems so obvious that no thought is given to any other.

Calgary firms tend to consider alternative locations to a greater degree than do Edmonton firms (19.6% compared to 14.8%). Of the Calgary firms, 10.8 percent consider other cities only in a general way. This

compares to 6.4 percent in Edmonton. Only the remaining 8.8 percent of Calgary firms and 8.4 percent of Edmonton firms make their choice of location on the basis of carefully weighing the relative advantages of sites in more than one city.

Ten of 21 Edmonton firms (48%) and seven of 15 Calgary firms (47%) that consider more than one city, limit their attention to other Alberta cities. Only 11 of 21 (52%) Edmonton firms and 8 of 15 (53%) Calgary firms, that consider more than one city, look beyond Alberta for possible sites. Only 33 percent and 13 percent, respectively, do so in detail.

There is some indication that the larger the firm, the more willing it is to search for alternative locations. This is to be expected. Larger firms generally have a more specialized staff and greater resources which enables them to undertake location studies.

Previous manufacturing experience has a positive effect upon the firm's willingness to investigate the relative attractiveness of other cities. This reflects that experienced people are more aware of the importance of a suitable site than are non-experienced people. The above holds true for both Edmonton and Calgary firms.

Very few firms retain consultants to advise them on their location-problems (2.9 percent of Edmonton firms and 2.1 percent of Calgary firms do so). The sample of firms which retained consultants is too small to enable us to draw any inferences.

It appears that "local people" place more emphasis on the personal element of plant location than do "outside people". Twenty-seven percent of Edmonton firms and 43 percent of Calgary firms that are

established by "outside people" considered other possible locations. This is compared to nine percent and 11 percent, respectively, of firms that are established by "local people".

Firms that do not consider any other city seem to be as satisfied with their locations as are firms which investigate other potential cities. This is contrary to what one would expect. The only explanation that the writer can give, is that firms which do not consider other cities are not as aware of other opportunities; hence, they are more satisfied with their present site. The reason for their greater satisfaction may be explained by the cliché: "ignorance is bliss".

The above analysis of this chapter leads us to conclude that there is an element of chance in plant location. Firms are guided by general impressions and few know or take the trouble to find out what other cities have to offer. If firms do find the optimum location, then most of them do so by chance. Few choose the location for their new plants with a wide knowledge of alternatives.

CHAPTER V

SUMMARY AND RECOMMENDATIONS FOR FURTHER RESEARCH

Introduction

The principal purpose of this thesis is to investigate the process of location decision-making. Hopefully, this examination provides a better understanding of how the decision-making process can be applied to plant location. Such an understanding, with knowledge of local location factors is of value to scientific location decision-making.

Both a theoretical (normative) and an empirical approach to location decision-making is examined. The normative approach outlines the steps in the process of decision-making. The possibility of applying these steps to the location-decision is then investigated. Chapter II describes this theoretical approach. Empirical data on how local location-decisions actually were made is analysed in Chapter IV. A sample of Edmonton and Calgary manufacturers provides this data. All Edmonton and Calgary manufacturers who filed a Manufacturers' Report with the Alberta Bureau of Statistics between the years 1959 and 1966 received a pretested questionnaire. The primary purpose of the survey is to gain a better understanding of why Edmonton and Calgary were chosen as plant sites.

Location-Decisions : Normative Approach

A normative procedure for making plant location-decisions may be constructed. Its fundamental steps are: (1) to formulate objectives that can be furthered by an industrial plant, either as related to a

problem or to additional opportunity; (2) to plan the attainment of these objectives by: (a) determining the type of plant; (b) examining the potential alternative locations; (c) evaluating the possible locations in relation to location factors; (d) selecting the most suitable plant location. The final step involves the implementation of the decision (e.g. the establishment of a plant in the location chosen).

The above normative procedures may be utilized by any industrial firm. However, each manufacturer has particular objectives, problems, opportunities, and a constantly changing environment. The procedure, therefore, requires adaption to the special circumstances of each firm every time a location-decision is made. There is little indication that a normative procedure, such as outlined above, was employed by Edmonton and Calgary manufacturers.

Industrial location planning should involve strategic planning. Attributes of strategic planning are as follows:

1. Strategic planning is complex. It requires creative and analytical mental activity. Proper industrial location planning has similar characteristics. Economic, social, and personal objectives are involved. Possible changes in these broad objectives must be incorporated into particular objectives. The number of decision criteria that require consideration are numerous and dynamic.

2. Strategic planning has no set schedule; each objective is different. Location-decisions are also unique, and are dependent upon a firm's objectives and circumstances.
3. The time period involved in strategic planning has a tendency to be long. Location-decisions involve the life of an industrial plant and are consequently concerned with a relatively long period of time.
4. Appraisal of the soundness of strategic planning is difficult. This is also true for industrial planning. Objectives change, estimates of the future always have a degree of uncertainty, and the firm's environmental factors change.

The above similarities between the attributes of strategic planning and industrial planning leads to the conclusion that proper industrial planning requires strategic planning.

Decision Criteria

A decision criterion is one of the tests that can be used to evaluate potential alternative locations. Industrial location factors are related, in total, to the accomplishment of objectives. These objectives are economic, personal (emotional), and social. As objectives change in response to shifting circumstances, location factors also vary in importance. Consequently, the various location factors that can be considered are numerous.

A location can only be as efficacious as the best of the locations considered; that is, the best location will contribute the most toward

the attainment of objectives. In order to make a sound distinction between locations, it becomes necessary to disregard the common aspects of a situation and focus on differences. To the extent that all potential locations will satisfactorily meet certain requirements, there is no basis for choice. The opportunity for making a choice will be found as differences are discovered. Consequently, the more locations that are considered, the greater will be the basis for discrimination.

There are three basic types of factors (decision criteria) recognized by Management Theory and Location Economic Theory. These are: (1) crucial factors; (2) limiting factors; and (3) restrictive factors.

Crucial criteria are the major considerations, or advantages, which are sought. These are the decisive factors. The limiting factors relate to the disadvantages which must be removed, or changed if the purpose is to be accomplished. These are generally environmental factors. Restrictive factors limit the "free choice" of a location. These factors are usually geographical or political. The extent to which Edmonton or Calgary firms considered these types of factors is summarized in the next section.

Location-Decisions : Empirical Approach

The Edmonton and Calgary surveys examine four aspects of location-decisions. These aspects are: (1) the extent to which alternative locations are considered; (2) the location factors considered; (3) the relative importance of these factors; (4) the degree to which firms are satisfied with the location. Data obtained by questionnaire from Edmonton and Calgary manufacturers analyzes the above.

The majority (83 percent) of the location-decisions in the two surveys are made without evaluating alternative locations. There is no indication that firms confirm their choice of location on an economic basis. Of the firms which consider alternatives, only half do so in detail. Choice making devices, such as securing consensus from outside competent sources, pilot surveys, and so on are not recognized by most firms. The surveys appear to indicate that the majority of Edmonton and Calgary firms do not follow the normative approach to plant location.

The location factors and their relative importance are analyzed in chapter IV. The three most important location factors appear to be: (1) that the founder already lived in the city; (2) nearness to major markets; and (3) lack of competition in the area.

Edmonton and Calgary firms are influenced mainly by personal factors in their location-decisions. The total influence of limiting factors are much less important to the firms surveyed. The restrictive factors are non-existent in the Edmonton and Calgary surveys. Indications are that most of the firms surveyed recognize an apparent advantage of locating in their city and did so without further justification.

The majority of the firms appear relatively satisfied with their location choice. Three possible reasons for their satisfaction are

hypothesized: (1) they are not aware of other opportunities due to their neglect to search for alternatives; (2) they failed to define precisely the objectives which the plant is to aid in attaining; and (3) some firms find an optimum or satisfactory location largely by good luck.

Justification of the Study

The concerns of this thesis can be justified from several points of view. One relates to the purposes outlined in chapter I. There is still much to learn about the process of decision-making and its relationship to such important decisions as plant locations. Much has been written on the normative approach to decision-making but the inter-relationship of factors, their order, and the extent to which these factors are considered in real life remains in the realm of the unknown.

A second justification is that knowledge of conditions sought by industry can be utilized to establish a sound industrial environment. The disclosure of the method by which location-decisions are made by individual firms should give insight into how these decisions are actually made. By combining this understanding with knowledge of the factors which are attractive to industry, a community can plan more effectively for economic betterment. This will enable a community to plan a productive program to attract industry. From the point of view of a relatively small area (such as a city) an increase in manufacturing employment can: (1) improve the standard of living; and (2) prevent or lessen a costly "emptying out" of the area.

Third, a general approach to plant location-decisions enables an industrial firm to plan the location of a plant with more assurance of success. Although each firm has a unique decision to make, generalizations are relevant. A general procedure makes certain that a decision-element (either a location factor or a step in the decision-making process) vital to the decision is not disregarded. Each firm, however, will have to develop its own unique set of requirements. The procedure outlined in this study should be helpful in this regard.

The ideal plant location is one that matches the particular factors that a community possesses with the particular requirements of the individual industrial firm. Such a location-decision will contribute most in the long run towards success for the firm and, therefore, to the steady economic growth of the community.

Limitations of This Study and Recommendations for Further Research

This study suffers from some of the major drawbacks that are common to surveys that rely upon questionnaires. One of these drawbacks is the reporting error. The questionnaire and covering letter were addressed to "The Manager" of each of the firms, however, the manager may not necessarily have made the location-decision or even know what factors influenced the decision. It is quite conceivable that the manager (or someone designated by him) merely indicated the factors he thought were important, rather than direct the questionnaire to the persons who actually made the location-decision. In particular, this may be true for large firms who set up subsidiaries in Edmonton (or Calgary).

The reporting error may even occur in questionnaires that were answered by persons responsible for the location-decision. This may be due to: (1) the inability of the firm to recall the location factors that actually prompted the location-decision; (2) the inaccuracies in respondents' answers and in the way these answers are analysed and interpreted by the researcher; and (3) the poorly designed questions which may influence the respondents' answers. The validity of the information obtained in any survey depends in part on the questionnaire design. Most surveys on plant location must in addition to obtaining straightforward answers examine the attitudes of business executives.

In one respect the survey for this study poses no serious problems. Practically no financial or other data which might be regarded as confidential by the respondents or as valuable to his competitors is required. Yet, examining the attitudes of business executives towards taxes, labor, and the cities' business climate is not easy. One method used in this questionnaire to penetrate beneath the surface is to ask a series of questions relating to a particular point. For example, firms are not merely asked whether they are satisfied with their present location. In addition, they are asked to specify the factors that accounted for their satisfaction or what factors influenced them to prefer some other location. Similar follow up questions are asked throughout the questionnaire.

Question seven of the questionnaire used in this survey contains the major weakness in this study. (This question requires the respondent to rank the five most important factors in order of importance to his decision to locate the plant in its present location.) The twenty, loosely defined

location factors listed in this question are not mutually exclusive and are subject to the interpretation of the respondent. The purpose of the survey was to determine only the factors that influenced the firm to locate in its present site. It is conceivable, however, that firms who considered more than one location listed factors that are important to the firm's success but these factors may be nonexistent at the present location. The factor most important to the firm's success may be more attractive at some other location, however, the sum total of the other four factors may out-weigh the single most important factor in favour of the firm's present location. In the above situation the firm may list this factor, when in fact it did not influence the decision to locate in the present site. This weakness should be avoided in future studies by emphasizing that the firm list only those factors that were influential in locating the plant in its present site. Any factors that were favorable elsewhere should be omitted.

This study was concerned merely with the ordinal ranking of the location factors. No effort was made to weigh the relative importance of these factors. For example, one firm may consider "nearness to market" as a much more important factor whereas another firm may consider "personal preference" only slightly more important than the next ranking factor. In this study, both factors received equal weight. Although difficult to measure, future studies of this type should concentrate on developing a scale by which these factors could be weighted. In this way we could better evaluate the importance of the various location factors to manufacturers.

It is also possible that firms may be adversely affected by certain factors and, therefore, list these factors as important to their location

because they are prominent in their thinking. Such an error would produce a negative list of factors rather than a positive list. These defects should be avoided in future location studies.

Even with a well designed questionnaire, it is known that respondents may be influenced by the particular wording of individual questions. Survey responses may also reflect the respondent's mood or personality factors which are unrelated to the attitudes to be examined. However, if the same question is answered by two large groups in different geographical locations (as was the case in this survey) such individual differences should balance out. We can thus assume that the analysis of the aggregate response is indicative of the attitudes or opinions of Edmonton and Calgary manufacturers.

Further research might be directed towards the selection of a more inclusive list of location factors. The reliability of interpreting and ranking these factors should also be investigated. A more precise identification of the attitudes of the decision-maker is also required. Such an analysis might concern itself with the educational status, vocational background, and political views of the manufacturers.

A sound basis for further research will probably be forthcoming from investigation of first-order phenomena. That is, observations of actual location-decisions will likely form the foundation for future knowledge of location-decisions. The complex distortions involved in inferring location-decisions from second-order observations weakens the usefulness of such a study. The premise is that we must learn what actually occurs in location-decisions before we can understand it. What someone says happened is inadequate.

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